User Manual

& Installation Instructions

VB-10 thru VB-30

IMPORTANT – READ ALL INSTRUCTIONS BEFORE OPERATING

All steam boilers are built in accordance with ASME miniature boiler code.

NOTE: It is the responsibility of the installer to conform to any state or local codes. If further inspection, following modification by installer, is required under state or local codes, that is the responsibility of the local installer.

Electro-Steam
ESTABLISHED 1952

www.electrosteam.com

rev. 12292009

WARNING - The following labels have been placed on this boiler for **YOUR SAFETY**. Failure to observe these instructions could lead to **PROPERTY DAMAGE**, **SEVERE INJURY,** or even **DEATH**

CAUTION
HOT

CAUTION

THROW OFF MAIN POWER SWITCH BEFORE WORKING ON ELECTRICAL CABINET

A MANUAL WAS SHIPPED WITH THIS BOILER. IT IS IMPORTANT THAT YOU READ, UNDERSTAND, AND OPERATE THIS STEAM GENERATOR IN ACCORDANCE WITH THE OPERATING INSTRUCTIONS CONTAINED IN THE MANUAL. IF FOR ANY REASON YOU DO NOT HAVE A MANUAL, CALL ELECRTO-STEAM AT 800-634-8177

REPLACE GLASS EVERY SIX MONTHS

RETIGHTEN SIGHT GLASS BEFORE USE

CAUTION USE ELECTRICAL SUPPLY CONDUCTORS RATED FOR A MINIMUM OF 90°C

TERMINALS ARE SUITABLE FOR COPPER WIRE ONLY

U.L. 834 PAR. 4416

AMBIENT TEMPERATURE AROUND UNIT NOT TO EXCEED 105° F

TABLE OF CONTENTS

1.) INSTALLATION INSTRUCTIONS **4**
2.) OPERATION & SEQUENCE OF EVENTS **5**
3.) CLEANING & MAINTENANCE **6-14**
3.1) MANUAL "BLOW DOWN" **6**
3.2) CLEANING WATER LEVEL PROBES **6-7**
3.3) CLEANING OR REPLACING HEATERS **7**
3.4) REPLACING GLASS GAUGE AND RUBBER WASHERS **8-9**
3.4.1) BRASS SIGHT GLASS (STANDARD) 8
3.4.1) BRASS SIGHT GLASS (SEISMIC) 9
3.5) CHAMBER CLEANING & CHEMICAL TREATMENT **10-11**
3.6) PRESSURE CONTROL DATA SHEET **12**
3.7) SETTING THE PRESSURE CONTROLS **13-14**
4.) CALCULATIONS & DATA SHEETS **15-17**
4.1) HEATER POWER & VOLTAGE RATINGS **15**
4.2) TOTAL POWER RATING CALCULATIONS **15**
4.3) AMPERAGE CALCULATIONS **16**
4.4) ACTUAL POWER RATING CALCULATIONS **17**
4.5) STEAM CAPACITY CALCULATIONS **17**
5.) DRAWINGS & WIRING SCHEMATICS **18-26**
5.1) PARTS LEGENDS **18-19**
5.1.1) V-BLOCK 18
5.1.2) V-BLOCK (MAFD) 19
5.2) INSTALLATION DATA SHEETS **20-21**
5.2.1) V-BLOCK 20
5.2.2) V-BLOCK (MAFD) 21
5.3) CONTROL WIRING SCHEMATICS **22-23**
5.3.1) V-BLOCK 22
5.3.2) V-BLOCK (MAFD) 23
5.4) HEATER WIRING SCHEMATICS **24-26**
5.4.1) V-BLOCK (10-30KW) (THREE PHASE) 24
5.4.2) V-BLOCK (10-30KW) (SINGLE PHASE) 25
5.4.3) V-BLOCK (10-30KW) (THREE AND SINGLE PHASE) (550-600V) 26
6.) TERMS & CONDITIONS **27**

1.) INSTALLATION INSTRUCTIONS

V-BLOCK "VB-SERIES"

The Electro-Steam Generator design consists essentially of a high pressure chamber filled with water that is heated by one or more submerged resistance type electric heating elements. Automatic controls are provided to maintain the pre-set operating pressure and water level. Safety features include: automatic low-water cutoff (manual low-water reset optional), dual pressure controls, safety valve, and visible water level gauge. All of our generators are built in accordance with A.S.M.E. Miniature Boiler Code and are individually inspected and stamped by an Authorized National Board Insurance Inspector.

IMPORTANT – READ ALL INSTRUCTIONS BEFORE OPERATING

Important – Set unit perfectly level, and as close as possible to the steam vessel or appliance it will operate. For generator measurements, refer to Installation Data Drawing attached. For interpretation of numbered items, refer to Parts Legend Drawing attached. NOTE: Ambient temperature around this unit must not exceed 105°F.

CONNECTIONS:

Periodically check all plumbing and electrical connections for tightness; this should also be done before initial start-up.

ELECTRICAL:

This generator must be connected to a disconnect switch protected by fuses or circuit breakers with the proper size wire by a licensed electrician in accordance with N.E.C. and your local codes – Voltage, KW, and Phase requirement are marked on the nameplate.

WATER SUPPLY:

Connect city water line to **Y-Strainer (#6)**.
Purity: NOT to exceed 26,000 OHMS per CM
Temperature Range: 32°F – 140°F or 0°C – 60°C.
Pressure Range: 20PSI – 150PSI.

***CAUTION:** The **Pump (#8)** requires clean tap water. If the water is not free of foreign matter, a 5 micron cartridge filter should be installed in the water supply line.

STEAM OUTLET:

Connect **Steam Outlet Valve (#16)** to piece of equipment, vessel, room, or area to be operated by the Electro Steam Generator.

SAFETY VALVE & DRAIN:

Separately route the **Safety Valve (#18) & Drain (#23)** to a high temperature drain ***NO PVC**. Discharging pipe of the **Safety Valve (#18)** should never be smaller than the valve outlet and should be rigidly supported, placing no weight on the safety valve itself. If equipped with **Motorized Auto-Flush & Drain "MAFD" (#20)**, it should be routed with the **Drain (#23)**.

2.) OPERATION & SEQUENCE OF EVENTS

IMPORTANT – READ INSTALLATION INSTRUCTIONS BEFORE OPERATING

1. Turn on water supply from the source to the Generator.
2. **OPEN** all valves on the Generator except for the **Manual Drain (#19)**.
3. Place main disconnect switch in **ON** position.
4. Place **ON/OFF Switch (#2)** in **ON** position.
   - The **Water Solenoid (#7)** and **Pump (#8)** will engage and the chamber will begin to fill with water. As the water level rises, it will make contact with the **(G)** and **(A)** probes, indicating the heaters are safely submerged. At this time the contactor(s) will engage, supplying power to the heaters, causing steam pressure to accumulate.
   - The chamber will continue to fill with water until 1 second after the water makes contact with the **(C)** probe, causing the **Water Solenoid (#7)** and **Pump (#8)** to turn off.
   - If the contactor(s) still have not engaged at this time, you may need to press the **Safety Reset (#13)** on the "**Safety" Pressure Control (#12)**. If your generator is equipped with a **Manual Low-Water Reset (MLWR) (#3)**, it must be pressed at this time to engage the contactor(s). If your generator is equipped with a **Motorized Auto-Flush & Drain (MAFD) (#20)**, you must wait until it closes before the contactor(s) will engage. (approximately 3 minutes)
   - Steam pressure will continue to rise until is reaches its set operating pressure. This may take up to 25 minutes. At this time, the "**Control" Pressure Control (#12)** will cause the contactor(s) to disengage. The pressure will drop approximately **6-8 PSI** until the "**Control" Pressure Control (#12)** causes the contactor(s) to reengage, causing the pressure to rise again. The contactor(s) will continue to cycle on and off during operation.
5. The Generator is now fully operational and will produce steam until it is turned off.
   - As steam is exhausted, the water level will drop until 3 seconds after it breaks contact with the **(C)** probe. At this time, the **Water Solenoid (#7)** and **Pump (#8)**, will engage and the chamber will again fill with water. The chamber will continue filling until 1 second after the water makes contact with the **(C)** probe. The **Water Solenoid (#7)** and **Pump (#8)** will continue to cycle on and off during operation.
6. To shut off the Generator, place **ON/OFF Switch (#2)** in **OFF** position. Pressure will drop naturally as the chamber cools, or the Generator may be drained manually through **Manual Drain (#19)**. (See Manual Blow Down 3.1)

WARNING – **HOT WATER** and **STEAM** under **HIGH PRESSURE** can lift drain pipes right off the ground and cause **SERIOUS INJURY**. Make sure drain pipe is **SECURE** and **CANNOT** move. The drain must be directed into a **HIGH TEMPERATURE** drain (**NO PVC**) or outside.

3.) CLEANING & MAINTENANCE

The following cleaning procedures are **HIGHLY RECOMMENDED** in order to keep your Steam Generator in the best operating condition at all times.

3.1) MANUAL "BLOW DOWN"

A Manual "Blow Down" is an easy way to **GREATLY** extend the life of your Steam Generator. Using a Motorized Auto-Flush & Drain (MAFD) of course helps, but is not a "Cure all". The following is the **LEAST** amount of times recommended to blow down your generator:

NORMAL WATER AREAS – Should be done **ONCE A WEEK**.
BAD WATER AREAS – Should be done **ONCE A DAY**.
NORMAL WATER AREAS WITH MAFD – Should be done **TWICE A MONTH**.
BAD WATER AREAS WITH MAFD – Should be done **ONCE A WEEK**.

NOTE: The best time to Blow Down your generator is after it has been running for some time, while it is still hot.

1. Place **Toggle Switch (#2)** and **Main Disconnect Box** in **OFF** position.
2. Allow pressure to drop between **10** and **20 PSI**.
3. Open **Manual Drain (#19)** slowly, allowing **HOT WATER** and **STEAM** to blow out into the drain, cleaning out the generator.

NOTE: Blow Down your generator at any pressure you feel comfortable with. 10 to 20 PSI is only a recommendation. You may go higher or lower, but higher is always better.

WARNING – HOT WATER and **STEAM** under **HIGH PRESSURE** can lift drain pipes right off the ground and cause **SERIOUS INJURY**. Make sure drain pipe is **SECURE** and **CANNOT** move. The drain must be directed into a **HIGH TEMPERATURE** drain (**NO PVC**).

3.2) CLEANING WATER LEVEL PROBES

Water Level Probes are the heart of your generator. Almost all steam generator malfunctions are caused by dirty water level probes. **CLEANING** your **PROBES** is by far the **MOST IMPORTANT** maintenance step to keep your generator running properly. The following is the **LEAST** amount of times recommended to clean your probes:

NORMAL WATER AREAS – Should be done **TWICE A YEAR**.
BAD WATER AREAS – Should be done **3-4 TIMES A YEAR**.

NOTE: The best time to clean your probes is before you turn your generator on, while it is still cool.

1. Place **Toggle Switch (#2)** and **Main Disconnect Box** in **OFF** position.
2. Make sure generator is cool and the **Pressure Gauge (#15)** reads **0 PSI**.
3. Locate the **Water Level Probes (#5)** and pull the rubber boots off the probes plugs, exposing the wire connections.
4. Use **5/16" Socket** to remove wires from probes.
5. Use **13/16" Spark Plug Socket** to remove probes from chamber.

3.2) CLEANING WATER LEVEL PROBES (Continued)

6. Clean probes to remove rust and scaling.

   NOTE: To clean probes you may use wire wheel, wire brush, steal wool, or Scotch-Brite. (Wire wheel works the best) You may also want to try some sort of chemical like CLR remover or LIME-A-WAY.

7. Reinstall probes assuring each probe's length is assigned to its proper letter.
8. Reconnect wires to probes assuring each color is also assigned to its proper letter.

   NOTE: DO NOT make wires too tight. Just tighten enough to make contact. Over tightening can cause probe plugs to pull apart over time.

9. Push rubber boots back over the probe plugs.

Water Level Probe Specifications:

Letter Assignment on Chamber	A	B	C	D/G
Water Level Probe Length	5"	Not Used	3 ¾"	5 ¼"
Wire Color Assignment	RED	Not Used	BLACK	GREEN
Assignment on Dual Function Board	LLCO	Not Used	H	G

WARNING – There **MUST be NO PRESSURE** in the chamber when removing probes. If you must change probes while chamber is **HOT**, make sure the steam out and drain valves are open to assure chamber will remain depressurized. **DO NOT** touch probes with your bare hands while **HOT**, and be cautious of escaping steam from probe holes while probes are removed.

3.3) CLEANING OR REPLACING HEATERS

Heaters are located inside the control panel (#1) below the insulation barrier, bolted into the chamber. If (3.5) Chamber Chemical/Acid Treatments are not regularly done, heaters must be taken out at least **ONCE A YEAR**, cleaned with wire brush and reinstalled using a new gasket. If you are replacing or cleaning your heater elements:

1. Place **Toggle Switch (#2)** and **Main Disconnect Box** in **OFF** position.
2. Make sure generator is cool and the **Pressure Gauge (#15)** reads **0 PSI**.
3. Remove heater wires from heater(s), using an 11/32" or 3/8" Socket.
4. Unbolt and remove heater(s) using a 1/2" Socket.

   NOTE: Heater(s) may be difficult to get out; you may need to use some sort of pry bar to get them loose.

5. Clean heater(s) with wire brush. If replacing, dispose of old heater(s).
6. Reinstall heater(s) with new gasket(s).
7. Attach heater wires assuring proper wiring. *Refer to Heater Wiring Schematics attached*

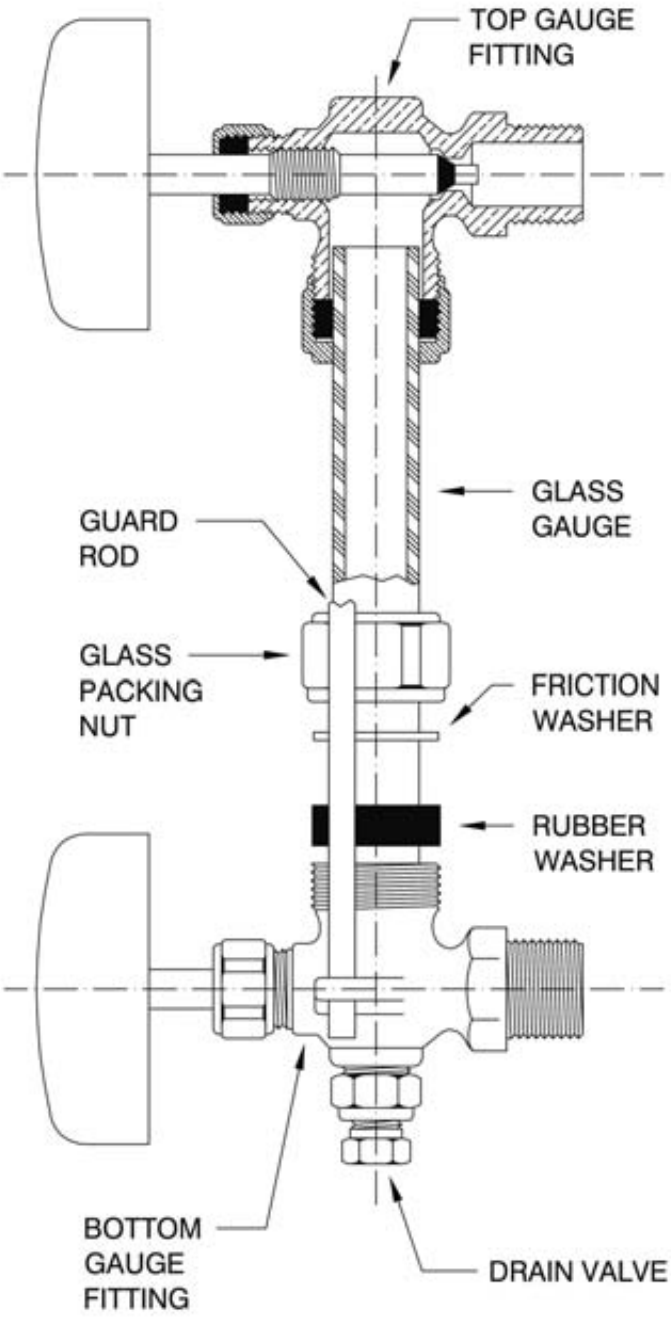
NOTE: If you are replacing a heater because of a heater failure, you must also clean the probes and clean out the chamber, or you may have another heater failure within 48 hours.

3.4) REPLACING GLASS GAUGE & RUBBER WASHERS OR GLASS PACKINGS

The **Sight Glass (#10)** gives the operator the ability to easily monitor the actual water level inside the chamber. If the **Sight Glass (#10)** gets clogged or is no longer functional, it can be very difficult to troubleshoot a problem.

3.4.1) BRASS SIGHT GLASS (STANDARD)

GLASS GAUGE and **RUBBER WASHERS MUST** be replaced **EVERY SIX MONTHS**



INSTALLATION:

Only properly trained personnel should install and maintain water gauge glass and connections. Remember to wear safety gloves and glasses during installation. Before installing, make sure all parts are free of chips and debris.

1. Uninstall **GUARD RODS**, **GLASS GAUGE**, and **RUBBER WASHERS**. (You may need to rotate one of the **GAUGE FITTINGS** to remove **GLASS GAUGE**)
2. Slip a new **RUBBER WASHER** on the new **GLASS GAUGE** about an inch from the bottom.
3. Now slip the following items through the top of **GLASS GAUGE** in the following order:
   - **FRICTION WASHER**
   - **GLASS PACKING NUT** (facing down)
   - **GLASS PACKING NUT** (facing up)
   - **FRICTION WASHER**
   - **RUBBER WASHER** (inch down from top)
4. Gently insert **GLASS GAUGE** into **GAUGE FITTINGS**. You may need to rotate **GAUGE FITTINGS** until vertically aligned, after **GLASS GAUGE** is in.
5. Carefully raise **GLASS GAUGE** about 1/16” from bottom and slide lower **RUBBER WASHER** down until it makes contact with the **BOTTOM GAUGE FITTING**. (**DO NOT** allow **GLASS GAUGE** to remain in contact with any metal)
6. Carefully slide upper **RUBBER WASHER** up as far as possible.
7. Hand tighten both **GLASS PACKING NUTS**, then tighten 1/2 turn more by wrench. Tighten only enough to prevent leakage. **DO NOT OVER TIGHTEN!** If any leakage should occur, tighten slightly, a quarter turn at a time, checking for leakage after each turn.
8. Reinstall **GUARD RODS**.

3.4) REPLACING GLASS GAUGE & RUBBER WASHERS OR GLASS PACKINGS (Continued)

The **Sight Glass (#10)** gives the operator the ability to easily monitor the actual water level inside the chamber. If the **Sight Glass (#10)** gets clogged or is no longer functional, it can be very difficult to troubleshoot a problem.

3.4.2) BRASS SIGHT GLASS (SEISMIC)

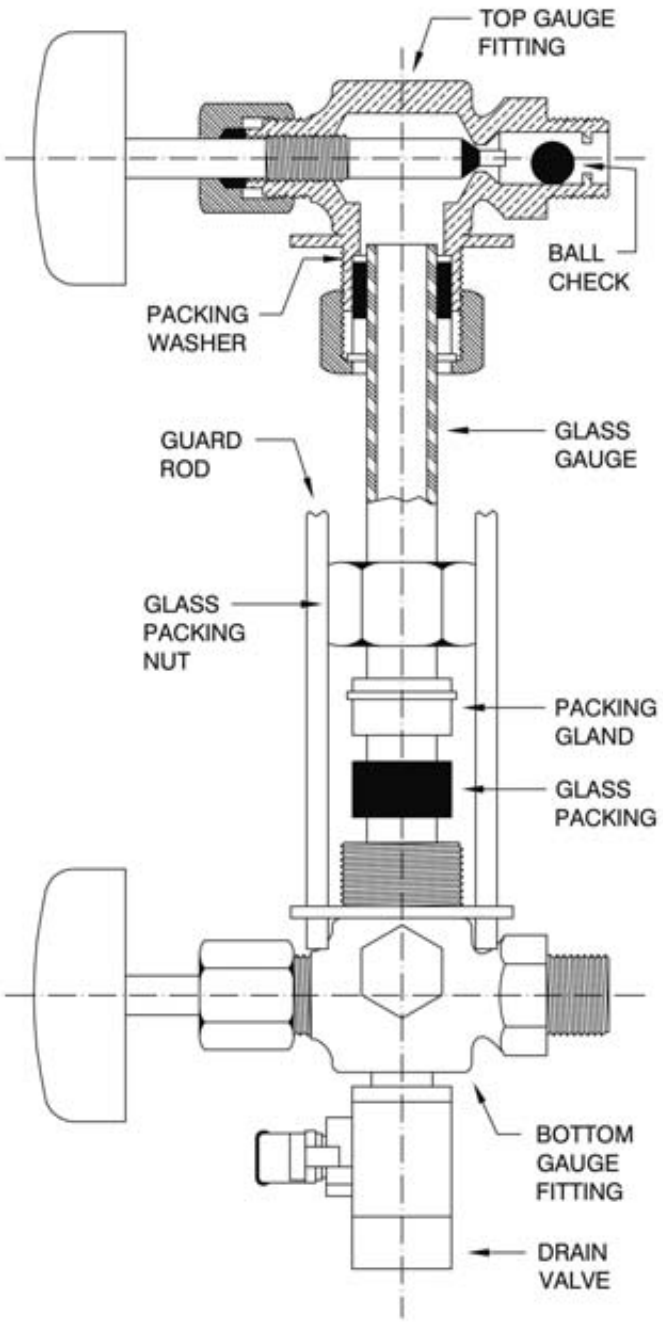
GLASS GAUGE and **GLASS PACKINGS MUST** be replaced **EVERY SIX MONTHS**

The Seismic Sight Glass is equipped with **BALL CHECKS** in each **GAUGE FITTING**.

INSTALLATION:

Only properly trained personnel should install and maintain water gauge glass and connections. Remember to wear safety gloves and glasses during installation. Before installing, make sure all parts are free of chips and debris.

1. Uninstall **GUARD RODS**, **GLASS GAUGE**, and **GLASS PACKINGS**. (You may need to rotate one of the **GAUGE FITTINGS** to remove **GLASS GAUGE**)
2. Slip a new **GLASS PACKINGS** on the new **GLASS GAUGE** about an inch from the bottom.
3. Now slip the following items through the top of **GLASS GAUGE** in the following order:
   - **PACKING GLAND** (facing down)
   - **GLASS PACKING NUT** (facing down)
   - **GLASS PACKING NUT** (facing up)
   - **PACKING GLAND** (facing up)
   - **GLASS PACKINGS** (inch down from top)
   - **PACKING WASHER**
4. Gently insert **GLASS GAUGE** into **GAUGE FITTINGS**. You may need to rotate **GAUGE FITTINGS** until vertically aligned, after **GLASS GAUGE** is in.
5. Carefully raise **GLASS GAUGE** about 1/16” from bottom and slide lower **GLASS PACKINGS** down until it makes contact with the **BOTTOM GAUGE FITTING**. (**DO NOT** allow **GLASS GAUGE** to remain in contact with any metal)
6. Carefully slide upper **GLASS PACKINGS** up as far as possible.
7. Hand tighten both **GLASS PACKING NUTS**, then tighten 1/2 turn more by wrench. Tighten only enough to prevent leakage. **DO NOT OVER TIGHTEN!** If any leakage should occur, tighten slightly, a quarter turn at a time, checking for leakage after each turn.
8. Reinstall **GUARD RODS**.



3.5) CHAMBER CHEMICAL/ACID TREATMENT

All Electric Steam Generator should be cleaned regularly. The following is the least amount of times recommended to clean out your chamber:

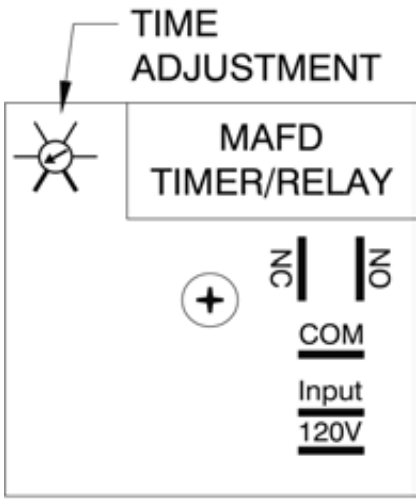
NORMAL WATER AREAS – Should be done **ONCE A YEAR**.
BAD WATER AREAS – Should be done **TWICE A YEAR**.

If equipped with Motorized Auto-Flush & Drain "MAFD" (#20), locate the **MAFD TIMER/RELAY** in the **Control Panel (#1)** and do steps 1-3 before the chamber treatment and steps 4-5 after chamber treatment is done:

WARNING – Before opening **Control Panel (#1)**, **TO AVOID ELECTRICAL SHOCK**, place **Main Disconnect Box** and the **Toggle Switch (#2)** in the **OFF** position.

BEFORE:

1. Dial **TIME ADJUSTMENT** on **MAFD TIMER/RELAY** all the way down to 15 seconds.
2. Make sure **MAFD (#20)** in the closed position.
3. Disconnect the orange wire from the normally open **(NO)** terminal on the **MAFD TIMER/RELAY**.



AFTER:

4. Reconnect the orange wire to the normally open **(NO)** terminal on the **MAFD TIMER/RELAY**.
5. Dial **TIME ADJUSTMENT** on **MAFD TIMER/RELAY** up to the desired flush time (Most commonly 3 minutes)

Chamber Treatment Instructions:

1. Turn on generator, allowing pressure to climb to **10** to **20 PSI** on **Pressure Gauge (#15)**, and then shut off.
2. **"Blow Down"** Open **Manual Drain (#19)** slowly, allowing **HOT WATER** and **STEAM** to blow out into the drain.

NOTE: You may Blow Down your generator at any pressure you feel comfortable with. **10** to **20 PSI** is only a recommendation. You may go higher or lower, but higher is always better.

WARNING – **HOT WATER** and **STEAM** under **HIGH PRESSURE** can lift drain pipes right off the ground and cause **SERIOUS INJURY**. Make sure drain pipe is **SECURE** and **CANNOT** move. The drain must be directed into a **HIGH TEMPERATURE** drain **(NO PVC).**

3. Remove **Safety Valve (#18)**.

WARNING – There **MUST** be **NO PRESSURE** in the chamber when removing the **Safety Valve (#18)**, make sure the steam out and drain are open to assure chamber will remain depressurized. Be cautious of escaping steam from chamber while **Safety Valve (#18)** is removed.

3.5) CHAMBER CHEMICAL/ACID TREATMENT (Continued)

4. Close **Manual Drain (#19)** and **Steam Out (#16)**; turn generator on until **Sight Glass (#10)** shows that it is 1/2 full, and then shut off.
5. Insert funnel into coupling, where **Safety Valve (#18)** used to be.
6. Pour a **1/2 Gallon** of hydrochloric acid (inhibited) solution **(NON-FOOD APPLICATIONS)** into funnel very slowly, being careful of fumes and venting while pouring.

NOTE: Solution can be obtained from any industrial chemical dealer.
FOR FOOD APPLICATIONS: Use FDA approved chemicals.

7. Remove funnel, reinstall **Safety Valve (#18)**, and verify **Steam Out (#16)** is closed; let solution set in generator for **1 HOUR.**
8. Turn on generator, allowing pressure to climb to **5 PSI** on **Pressure Gauge (#15)**, and then shut off.
9. Allow the pressure to drop to **0 PSI** on **Pressure Gauge (#15)** naturally. **DO NOT** open **Steam Out (#16)** or **Manual Drain (#19)** until pressure is down.
10. Remove **Safety Valve (#18)**.
11. Reinsert funnel, and fill generator completely to the top with clean water; let stand for an additional **1/2 HOUR**.

NOTE: Turning on the generator will not completely fill it to the top. Filling must be done manually through the safety valve coupling.

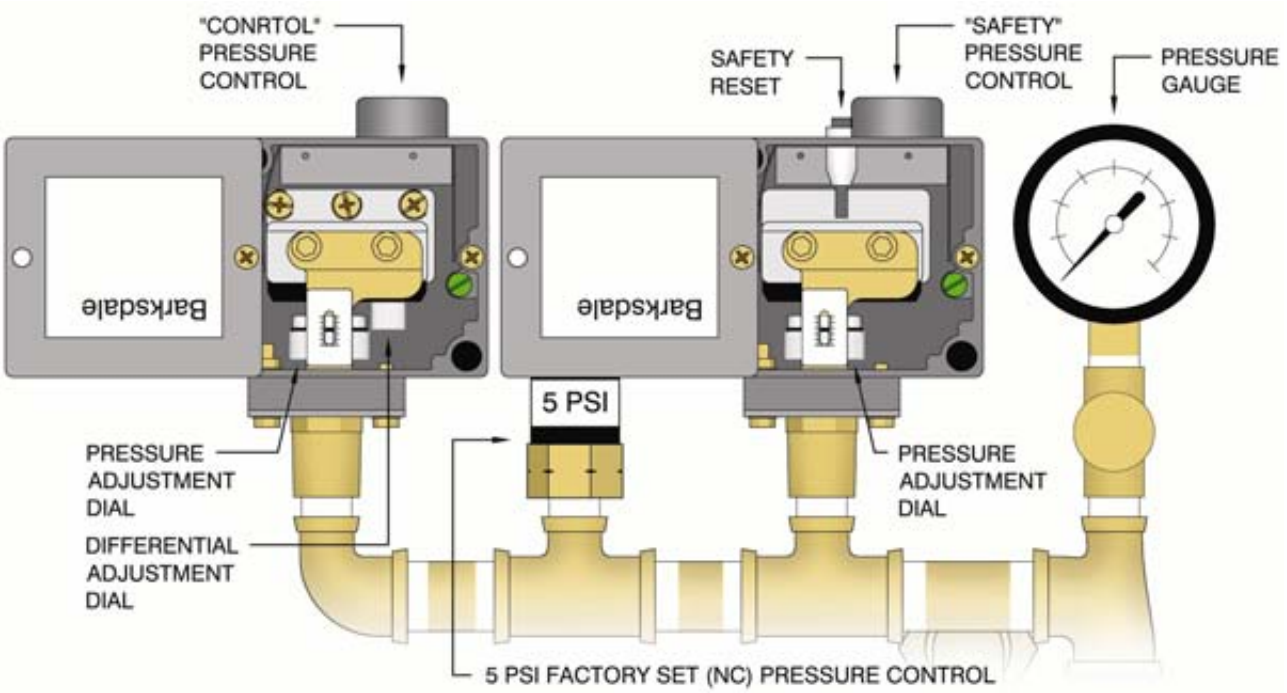
12. Open **Manual Drain (#19)** to drain generator.
13. Close **Manual Drain (#19)**; refill generator completely to the top with clean water and open **Manual Drain (#19)** to flush out generator **completely**.
14. Reinstall **Safety Valve (#18)** and close **Manual Drain (#19)**.
15. Turn on generator, allowing pressure to climb to **10** to **20 PSI** on **Pressure Gauge (#15)**, and then shut off.
16. **"Blow Down"** Open **Manual Drain (#19)** slowly, allowing **HOT WATER** and **STEAM** to blow out into the drain.

NOTE: You may Blow Down your generator at any pressure you feel comfortable with. **10** to **20 PSI** is only a recommendation. You may go higher or lower, but higher is always better.

WARNING – HOT WATER and **STEAM** under **HIGH PRESSURE** can lift drain pipes right off the ground and cause **SERIOUS INJURY**. Make sure drain pipe is **SECURE** and **CANNOT** move. The drain must be directed into a **HIGH TEMPERATURE** drain **(NO PVC).**

17. Your generator is now **ready for normal use and operation**.

3.6) PRESSURE CONTROL DATA SHEET



DEFINITIONS:

"CONTROL" PRESSURE CONTROL – This pressure control should be the only one controlling the operating pressure of the generator.

"SAFETY" PRESSURE CONTROL – This pressure control is only used if the "Control" fails. It is always set higher than the "Control"; if the operating pressure is passed, The "Safety" will turn the heaters off.

SAFETY RESET – This reset is tripped when the "Safety" turns the heaters off. It must be manually pushed to turn the heaters back on. This lets the user know there was a problem. If it is tripped, the "Control" most likely failed.

PRESSURE ADJUSTMENT DIAL – These dials adjust the set pressure at which each pressure control will turn the heaters off.

DIFFERENTIAL ADJUSTMENT DIAL – This dial is only on the "Control". When the "Control" turns the heaters off, the amount of pressure that is dropped before it turns the heaters back on (the differential) can be adjusted by this dial**.** This dial should never have to be adjusted, unless desired.

PRESSURE GAUGE – This tells the user what pressure is in the chamber. The pressure controls are set to this gauge.

5 PSI PRESSURE CONTROL – (Only used with "MAFD" Motorized Auto-Flush & Drain) this control prevents the MAFD from opening when there is more than 5 pounds off pressure in the generator.

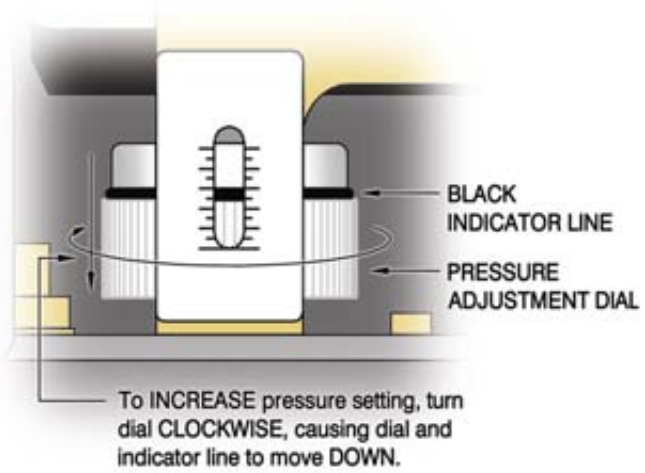
3.7) SETTING THE PRESSURE CONTROLS

SETTING PRESSURE CONTROLS INSTUCTIONS:

WARNING – The pressure controls must be set while all circuits are live. **TO AVOID ELECTRICAL SHOCK**, **DO NOT TOUCH** the wires or the terminals in which they connect while setting the pressure controls.

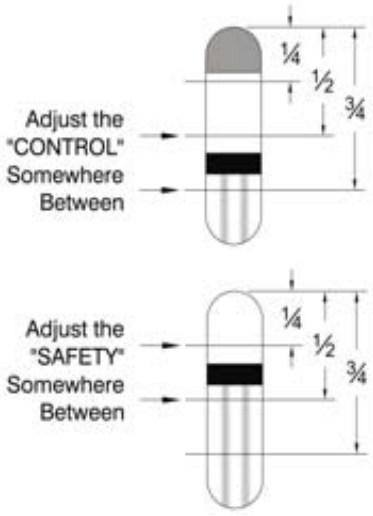
NOTES:

- Setting the pressure controls greatly relies on your ability to tell whether the contactor(s) are turning the heaters on or off. You should be able to hear the contactor(s), located inside the **Control Box (#1)**, click on and off. Familiarize yourself with this sound.
- The order in which the pressure controls must be set is the **"SAFETY"** and then the **"CONTROL"**.
- In order to set the **"SAFETY"** you must keep the **"CONTROL"** at a higher pressure setting than the **"SAFETY"**
- Once the **"SAFETY"** is set, then you can lower the **"CONTROL"** to its correct setting.
- To **INCREASE** the pressure setting, when looking down on pressure control, using your two index fingers, turn the **PRESSURE ADJUSTMENT DIAL CLOCKWISE**, causing the **BLACK INDICATOR LINE** to move **DOWN** the scale.
- To **DECREASE** the pressure setting, turn the dial **COUNTER CLOCKWISE**, causing the indicator line to move **UP** the scale.


BLACK INDICATOR LINE
PRESSURE ADJUSTMENT DIAL
To INCREASE pressure setting, turn dial CLOCKWISE, causing dial and indicator line to move DOWN.

SETTING INSTRUCTIONS:

1. Open the pressure control covers, as shown on page 12.
2. Adjust the **PRESSURE ADJUSTMENT DIAL** on the **"CONTROL"** so that the **BLACK INDICATOR LINE** is somewhere between ½ and ¾ of the way down from the top.
3. Adjust the **PRESSURE ADJUSTMENT DIAL** on the **"SAFETY"** so that the **BLACK INDICATOR LINE** is somewhere between ¼ and ½ of the way down from the top.
4. Close the **Steam Out (#16)** and turn on generator. When the contactor(s) click on, the pressure will rise. If contactor(s) do not click on right away, you may need to press **SAFETY RESET**. Continue to watch the **Pressure Gauge (#15)** until you hear the contactor(s) click off. This may take up to 20 minutes.



WARNING – DO NOT allow the pressure to exceed **100 PSI**, the rating on the **Safety Valve (#18)**. If contactor(s) do not turn off before **90-95 PSI**, manually shut off generator, open the **Steam Out (#16)**, and **DECREASE** the pressure setting on the "**SAFETY**" pressure control. Repeat step #4.

3.7) SETTING THE PRESSURE CONTROLS (Continued)

5. At this point the contactor(s) should be clicked off and you should be able to click them on and then off again by pressing the **SAFETY RESET**. This is a way to test if the "**SAFETY**" is still controlling the pressure, and not the **"CONTROL"**. While setting the "**SAFETY**" and the contactor(s) are off, if the **SAFETY RESET** does not cause the contactor(s) to click on and off again, **INCREASE** the setting on the "**CONTROL**"

WARNING – **DO NOT** allow the pressure to exceed **100 PSI** the rating on the **Safety Valve (#18)**. If contactor(s) do not turn off before **90-95 PSI**, manually shut off generator, open the **Steam Out (#16)**, and **DECREASE** the pressure setting on the "**SAFETY**" pressure control. If you cannot get the "**SAFETY**" to control the pressure, it may need to be replaced.

Pressure Control Settings		
	"Control"	**"Safety"**
High Pressure **(0-100 PSI)**	**80 PSI**	**85 PSI**

6. Open the **Steam Out (#16)** to exhaust some pressure. Continue pressing the **SAFETY RESET** until the contactor(s) click on and remain on. The pressure should eventually begin to rise. If it doesn't, throttle the **Steam Out (#16)** somewhere between closed and open until it does.

7. Pay attention to what the pressure reads when the contactor(s) click off. If the pressure stopped **BELOW 85 PSI**, then **INCREASE** the pressure setting on the "**SAFETY"**. If the pressure stopped **ABOVE 85 PSI**, then **DECREASE** the pressure setting.

8. Continue to watch the pressure go up and down, while adjusting the "**SAFETY**" and pressing the **SAFETY RESET**, until the pressure stops at **85 PSI**.

9. At this point the "**SAFETY**" should be set at **85 PSI**, and the "**CONTROL**" should be set somewhere above **85 PSI.**

10. Let the pressure drop below **80 PSI** and then press the **SAFETY RESET**, so that the contactor(s) click on. **DECREASE** the pressure setting on the "**CONTROL**" until the contactor(s) click off.

11. Repeat Step 10 until you no longer need to press the **SAFETY RESET** for the contactor(s) to click on.

12. Continue to watch the pressure go up and down, while adjusting the "**CONTROL**", until the pressure stops at **80 PSI**.

13. The Pressure Controls are now set.

NOTE: If at anytime the **SAFETY RESET** needs to be pressed after the pressure controls are set, either one of the controls are bad, the "**SAFETY**" is set too low, or the "**CONTROL**" is set too high.

4.) CALCULATIONS AND DATA SHEETS

4.1) HEATER POWER & VOLTAGE RATINGS

V-BLOCK Model units use **3 Heaters** to meet the required **(KW) POWER** from the customer's specified **INPUT VOLTAGE**. Each heater comes in **5** different **(KW) POWER RATINGS** and **4** different **VOLTAGE RATINGS**.

AVAILABLE HEATER RATINGS				
KW	**VOLTAGES**			
3.33	208	240	480	600
5.00	208	230	480	600
6.50	208	230	480	600
8.33	214	240	480	600
9.75	208	240	480	600

POWER RATINGS per MODEL		
MODEL UNIT	**QUAN.**	**KW**
VB-10	3	3.33
VB-15	3	5.00
VB-20	3	6.50
VB-25	3	8.33
VB-30	3	9.75

HEATER VOLTAGE RATINGS per INPUT VOLTAGE (VOLTS)														
Input Voltage	**208**	**220**	**230**	**240**	**380**	**400**	**415**	**425**	**440**	**460**	**480**	**550**	**575**	**600**
VB-10	208	208	240	240	208	240	240	240	480	480	480	600	600	600
VB-15	208	230	230	230	208	230	230	230	480	480	480	600	600	600
VB-20	208	230	230	230	208	230	230	230	480	480	480	600	600	600
VB-25	214	214	240	240	214	214	240	240	480	480	480	600	600	600
VB-30	208	208	240	240	208	240	240	240	480	480	480	600	600	600

NOTE: 380-425V heaters are not usually rated for 380-425V. They are usually 208-240V heaters that have been re-stamped 380-425V and wired in series.

4.2) TOTAL POWER RATING CALCULATIONS

The **HEATER POWER RATING** and **NUMBER OF HEATERS** are used to calculate the **TOTAL POWER RATING**. Since the **HEATER POWER RATINGS** are in Kilowatts, they must be multiplied by 1000 to convert them to Watts.

$$P_T = P_H X_H$$

DEFINITIONS:

P_T = Total Power Rating

P_H = Heater Power Rating

x_H = Number of Heaters

MODEL UNIT	VB-10	VB-15	VB-20	VB-25	VB-30
Heater Power Rating (Watts)	3,333	5,000	6,500	8,333	9,750
X Number of Heaters	3	3	3	3	3
Total Power Rating (Watts)	10,000	15,000	19,500	25,000	29,250

4.3) AMPERAGE CALCULATIONS

The **INPUT VOLTAGE, PHASE, TOTAL POWER RATING,** and **HEATER VOLTAGE RATING** are used to calculate the amperage.

NOTE: 380-425V heaters are not usually rated for 380-425V. They are usually 208-240V heaters that have been re-stamped 380-425V and wired in series.

FORMULAS TO CALCULATE AMPERAGE			
THREE PHASE		**SINGLE PHASE**	
208-240V & 440-600V	**380-425V (using 208-240V heaters)**	**208-240V & 440-600V**	**380-425V (using 208-240V)**
$I = \frac{P_T V_I}{V_H^2 \sqrt{3}}$	$I = \frac{P_T V_I}{(\sqrt{3} V_H)^2 \sqrt{3}}$	$I = \frac{P_T V_I}{V_H^2}$	Not possible with odd number of heaters

DEFINITIONS:

I = Amperage **V_I = Input Voltage**

P_T = Total Power Rating **V_H = Heater Voltage Rating**

THREE PHASE AMP DRAW CALCULATIONS (AMPS)														
Input Voltage	**208**	**220**	**230**	**240**	**380**	**400**	**415**	**425**	**440**	**460**	**480**	**550**	**575**	**600**
VB-10	27.8	29.4	23.1	24.1	16.9	13.4	13.9	14.2	11	11.5	12	8.82	9.22	9.62
VB-15	41.6	36	37.7	39.3	25.4	21.8	22.6	23.2	16.5	17.3	18	13.2	13.8	14.4
VB-20	54.1	46.8	48.9	51.1	33	28.4	29.4	30.1	21.5	22.5	23.5	17.2	18	18.8
VB-25	65.6	69.3	57.6	60.1	39.9	42	34.7	35.5	27.6	28.8	30.1	22.1	23.1	24.1
VB-30	81.2	85.9	67.4	70.4	49.4	39.1	40.6	41.5	32.3	33.7	35.2	25.8	27	28.1

SINGLE PHASE AMP DRAW CALCULATIONS (AMPS)														
Input Voltage	**208**	**220**	**230**	**240**	**380**	**400**	**415**	**425**	**440**	**460**	**480**	**550**	**575**	**600**
VB-10	48.1	50.9	39.9	41.7	Not possible with odd number of heaters				19.1	20	20.8	15.3	16	16.7
VB-15	72.1	62.4	65.2	68.1					28.6	29.9	31.3	22.9	24	25
VB-20	93.8	81.1	84.8	88.5					37.2	38.9	40.6	29.8	31.1	32.5
VB-25	114	120	99.8	104					47.7	49.9	52.1	38.2	39.9	41.7
VB-30	141	149	117	122					55.9	58.4	60.9	44.7	46.7	48.8

4.4) ACTUAL POWER RATING CALCULATIONS

Because the **HEATER VOLTAGE RATINGS** only come in 4 different voltages, and there are so many different voltages in the field, the **TOTAL POWER RATING** is only completely accurate if the **VOLTAGE IN** is exactly equal to the **HEATER VOLTAGE RATING**. This means, in most cases, the **TOTAL POWER RATING** is not completely accurate. The **AMERAGE** and **INPUT VOLTAGE** can be used to calculate the **ACTUAL POWER RATING**.

FORMULAS TO CALCULATE ACTUAL POWER RATINGS	
THREE PHASE	**SINGLE PHASE**
$P_A = I V_I \sqrt{3}$	$P_A = I V_I$

DEFINITIONS:

I = Amperage

P_A = Actual Power Rating

V_I = Input Voltage

ACTUAL POWER RATING CALCULATIONS (KW)														
Input Voltage	**208**	**220**	**230**	**240**	**380**	**400**	**415**	**425**	**440**	**460**	**480**	**550**	**575**	**600**
VB-10	10	11.2	9.18	10	11.1	9.26	9.97	10.5	8.4	9.18	10	8.4	9.18	10
VB-15	15	13.7	15	16.3	16.7	15.1	16.3	17.1	12.6	13.8	15	12.6	13.8	15
VB-20	19.5	17.8	19.5	21.2	21.7	19.7	21.2	22.2	16.4	17.9	19.5	16.4	17.9	19.5
VB-25	23.6	26.4	23	25	26.3	29.1	24.9	26.1	21	23	25	21	23	25
VB-30	29.3	32.7	26.9	29.3	32.5	27.1	29.2	30.6	24.6	26.9	29.3	24.6	26.9	29.3

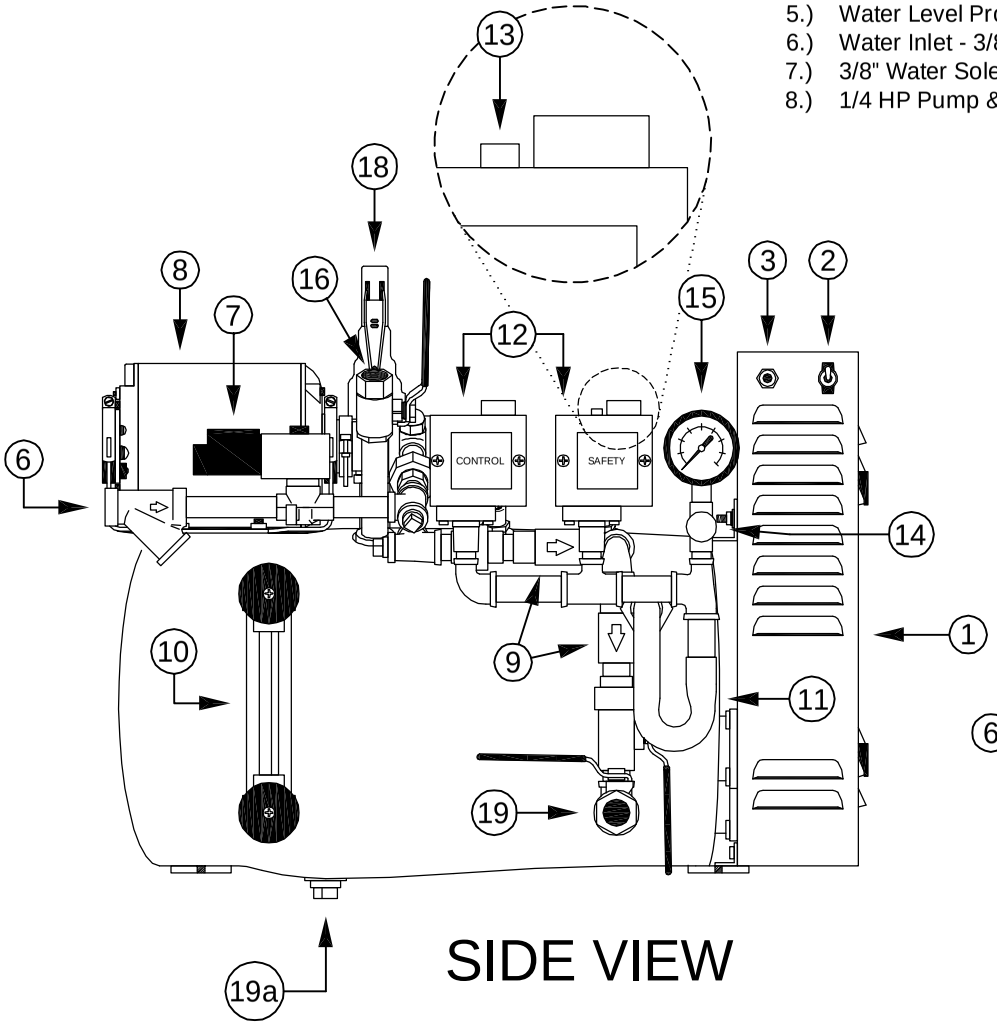
4.5) STEAM CAPACITY CALCULATIONS

Steam Capacity Calculations are based on the impossible feed water temperature of 212°F.
WARNING – Anything above 140°F will cause damage to water solenoid and pump.

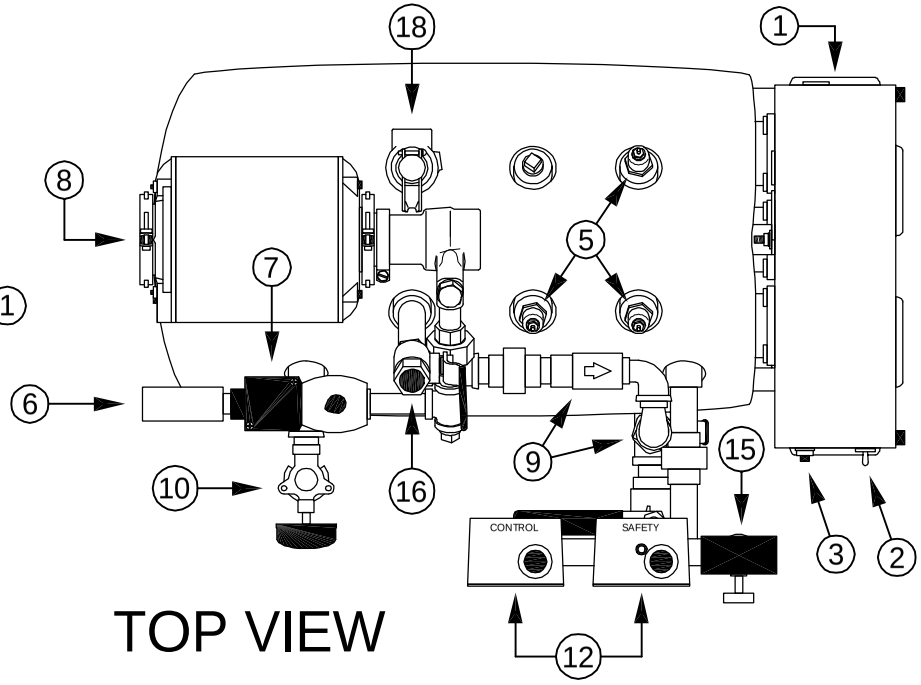
NET STEAM CAPACITY CALCULATIONS				
MODEL UNIT	Feed Water @ **212°F**	Feed Water @ **140°F**, 90% of 212°F	Feed Water @ **100°F**, 80% of 212°F	Feed Water @ **60°F**, 75% of 212°F
VB-10	**34.5** LB/hr - **15.7** Kg/hr	**31.1** LB/hr – **14.1** Kg/hr	**27.6** LB/hr – **12.5** Kg/hr	**25.9** LB/hr – **11.8** Kg/hr
VB-15	**51.7** LB/hr - **23.5** Kg/hr	**46.5** LB/hr – **21.1** Kg/hr	**41.4** LB/hr – **18.8** Kg/hr	**38.8** LB/hr – **17.6** Kg/hr
VB-20	**69.0** LB/hr - **31.3** Kg/hr	**62.1** LB/hr – **28.2** Kg/hr	**55.2** LB/hr – **25.0** Kg/hr	**51.8** LB/hr – **23.5** Kg/hr
VB-25	**86.0** LB/hr - **39.0** Kg/hr	**77.4** LB/hr – **35.1** Kg/hr	**68.8** LB/hr – **31.2** Kg/hr	**64.5** LB/hr – **29.3** Kg/hr
VB-30	**103.5** LB/hr - **47.0** Kg/hr	**93.2** LB/hr – **42.3** Kg/hr	**82.8** LB/hr – **37.6** Kg/hr	**77.6** LB/hr – **35.2** Kg/hr

PARTS LEGEND - V-BLOCK

1.) Control Panel
2.) ON/OFF Switch
3.) Manual Low-Water Reset (MLWR) (Optional)
5.) Water Level Probes
6.) Water Inlet - 3/8" Y-Strainer
7.) 3/8" Water Solenoid
8.) 1/4 HP Pump & Motor
9.) 1/2" Check Valves
10.) 5/8" x 6 1/4" Sight Glass (Seismic Optional)
11.) Water Barrier - 1/2" U-Tube
12.) 0-90 PSI Pressure Controls
13.) Reset on "Safety" Pressure Switch
14.) 1/4" Needle Valve
15.) 0-160 PSI Pressure Gauge
16.) Steam Out - 1/2" Ball Valve
18.) Safety Relief Valve
19.) Manual Drain - 3/4" Ball Valve
19a.) Auxiliary Drain - 3/4" Plug



SIDE VIEW



TOP VIEW

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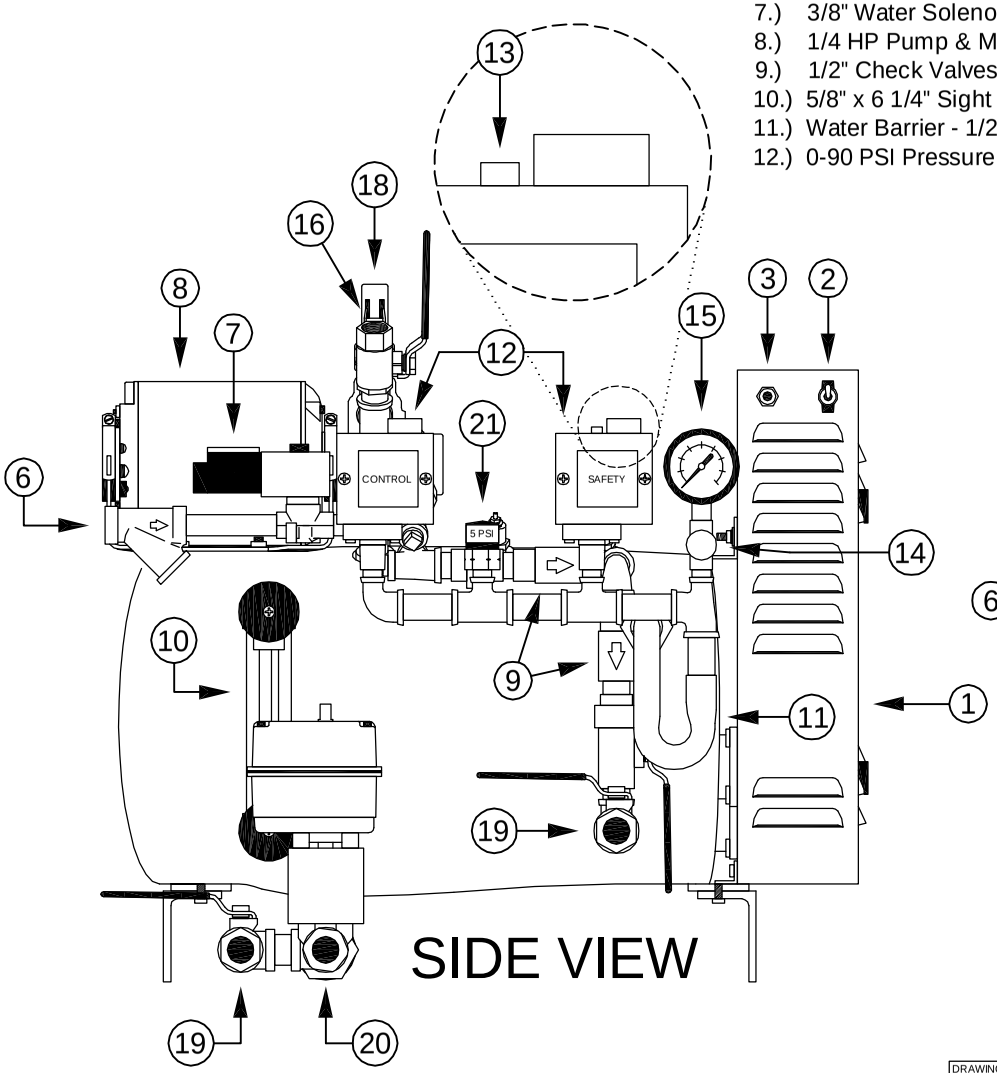
DRAWING TITLE: (PARTS LEGEND) V-BLOCK		MODEL UNIT: VB 10-30		ELECTRO-STEAM GENERATOR CORP.	
DECRIPTIONS:	DRAWN BY:	CHRISTOPHER FERRARA	08-15-07	50 Indel Ave. P.O. Rancocas, NJ 08073-0438	
HIGH PRESSURE	CHECKED:	SAL NEGRO	08-15-07		
-	ENGINEER:	CHRISTOPHER FERRARA	08-15-07	DWG NO.: 331-010-030-000200	SCALE: N/A
-	APPROVED:	JOHN PARDINI	08-15-07		SHEET: 1 OF 1

PARTS LEGEND - V-BLOCK (MAFD)

1.) Control Panel
2.) ON/OFF Switch
3.) Manual Low-Water Reset (MLWR) (Optional)
5.) Water Level Probes
6.) Water Inlet - 3/8" Y-Strainer
7.) 3/8" Water Solenoid
8.) 1/4 HP Pump & Motor
9.) 1/2" Check Valves
10.) 5/8" x 6 1/4" Sight Glass (Seismic Optional)
11.) Water Barrier - 1/2" U-Tube
12.) 0-90 PSI Pressure Controls
13.) Reset on "Safety" Pressure Switch
14.) 1/4" Needle Valve
15.) 0-160 PSI Pressure Gauge
16.) Steam Out - 1/2" Ball Valve
17.) 1/2" Vacuum Relief Valve
18.) Safety Relief Valve
19.) Manual Drain - 3/4" Ball Valve
20.) Motorized Auto-Flush & Drain (MAFD) (Optional)
21.) 5 PSI (NC) Pressure Switch for (MAFD)



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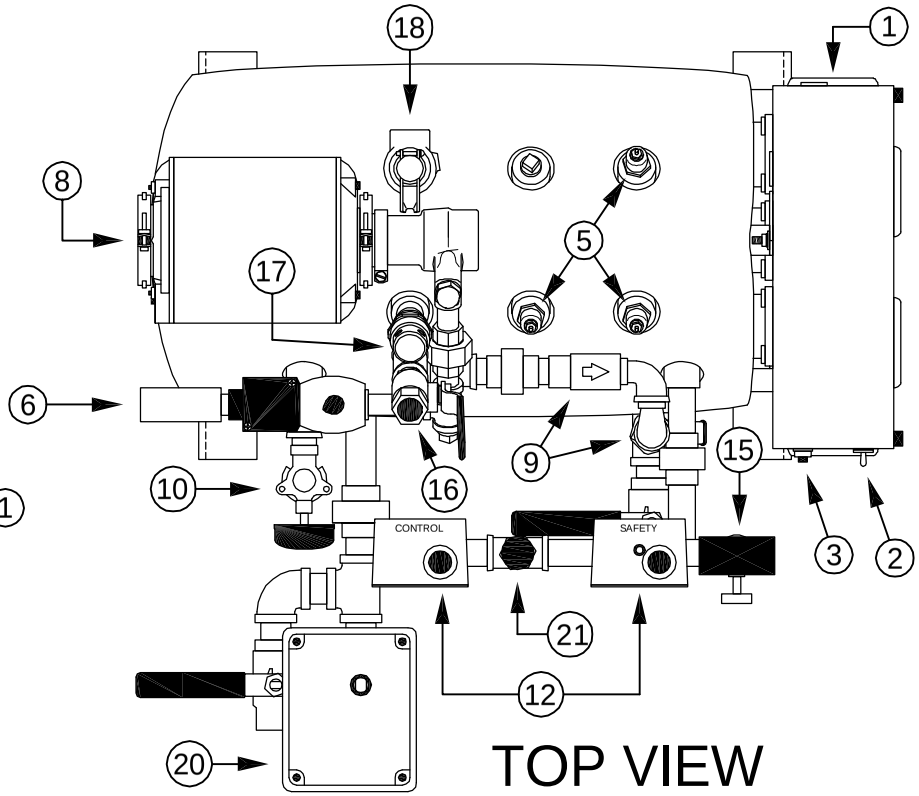

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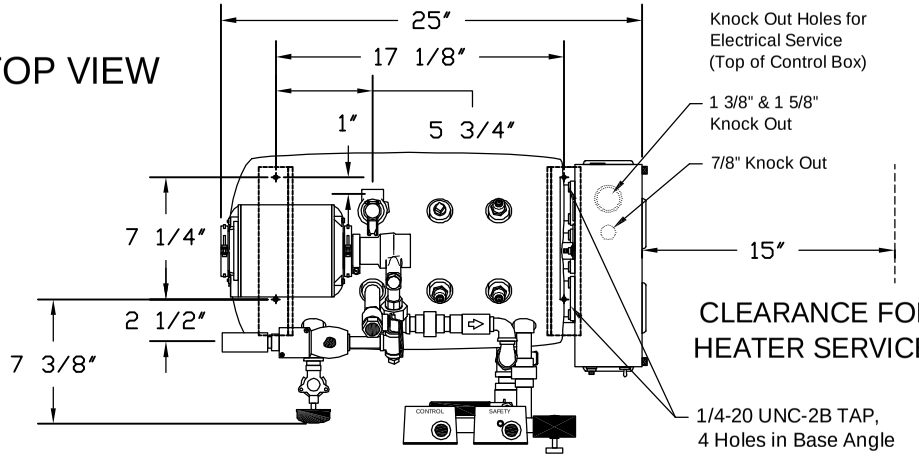
DECRIPTIONS:	DRAWN BY:	CHRISTOPHER FERRARA	08-15-07	50 Indel Ave. P.O. Rancocas, NJ 08073-0438	
HIGH PRESSURE	CHECKED:	SAL NEGRO	08-15-07		
MOTORIZED AUTO-FLUSH &DRAIN	ENGINEER:	CHRISTOPHER FERRARA	08-15-07	DWG NO.: 331-010-030-000210	SCALE: N/A
-	APPROVED:	JOHN PARDINI	08-15-07		SHEET: 1 OF 1

INSTALLATION DATA - V-BLOCK

TOP VIEW



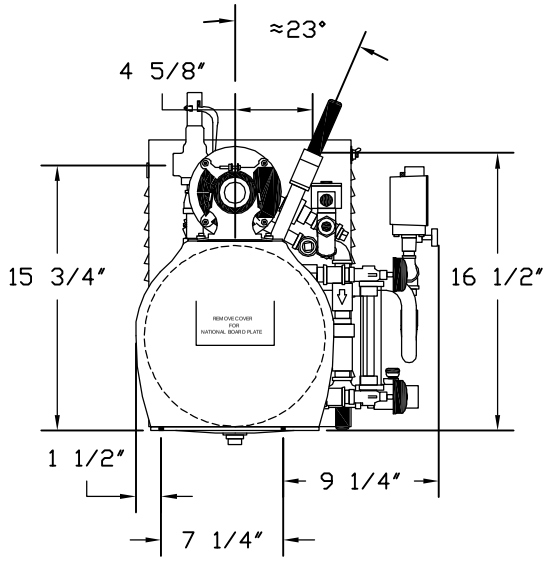
Knock Out Holes for Electrical Service (Top of Control Box)

1 3/8" & 1 5/8" Knock Out

7/8" Knock Out

CLEARANCE FOR HEATER SERVICE.

1/4-20 UNC-2B TAP, 4 Holes in Base Angle



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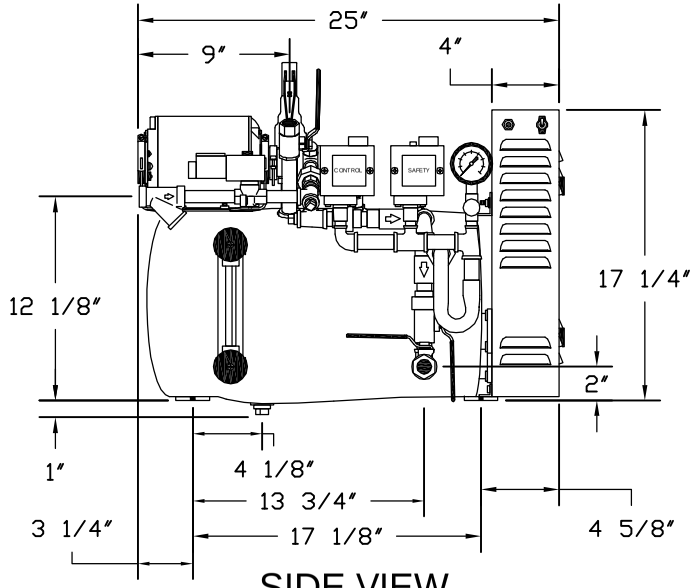

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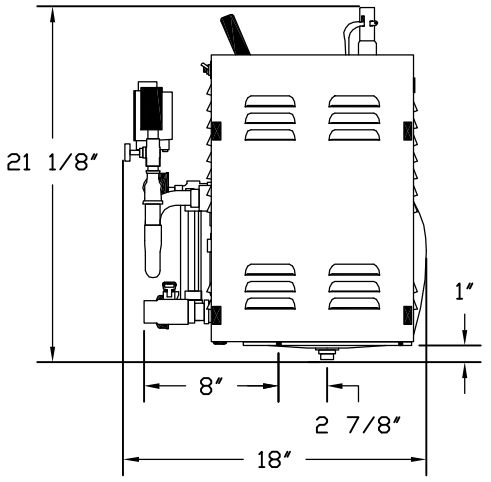

FRONT VIEW

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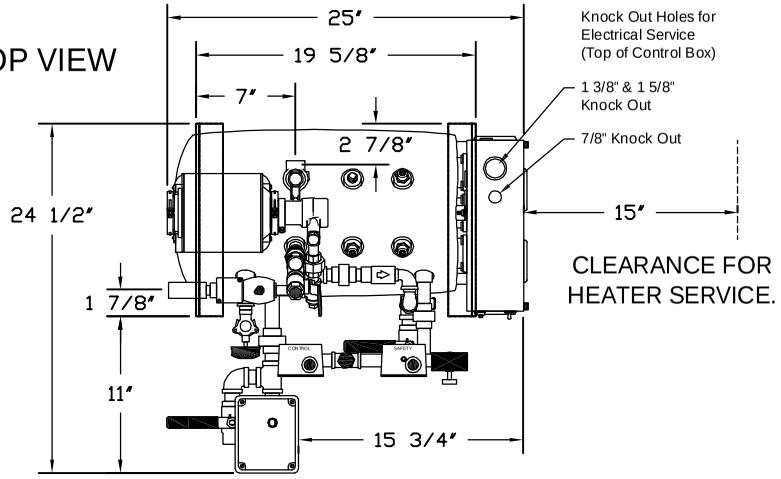
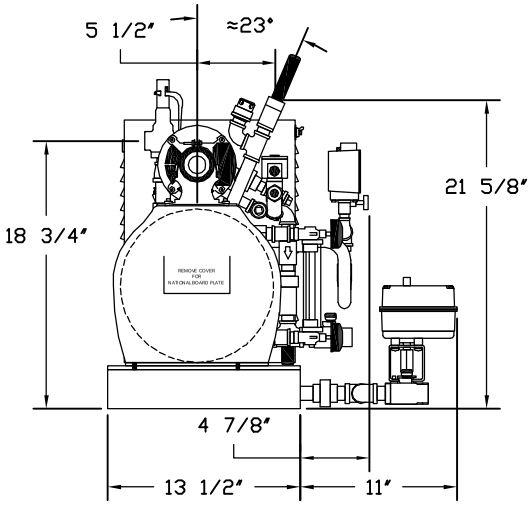
DRAWING TITLE: (INSTALLATION DATA) V-BLOCK		MODEL UNIT: VB 10-30		ELECTRO-STEAM GENERATOR CORP.	
DECRIPTIONS:	DRAWN BY:	CHRISTOPHER FERRARA	07-07-09	50 Indel Ave. P.O. Rancocas, NJ 08073-0438	
HIGH PRESSURE	CHECKED:	CHRISTOPHER FERRARA	07-07-09		
-	ENGINEER:	-	-	DWG NO.: 431-010-030-000200	SCALE: N/A
-	APPROVED:	SAL NEGRO	07-07-09		SHEET: 1 OF 1

INSTALLATION DATA - V-BLOCK (MAFD)

TOP VIEW





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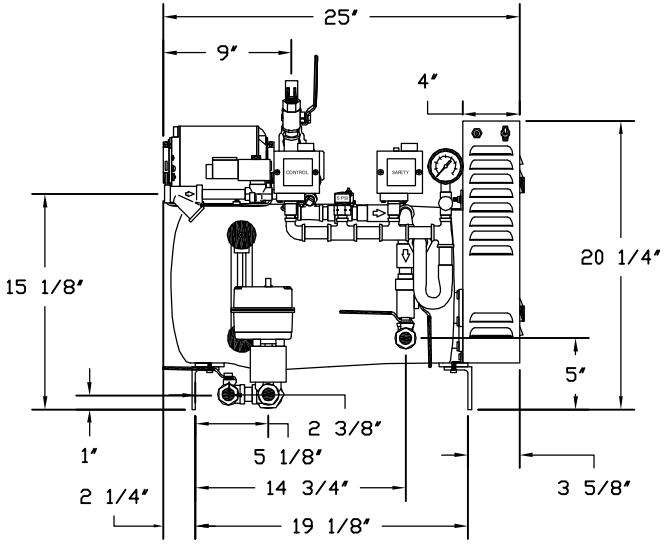
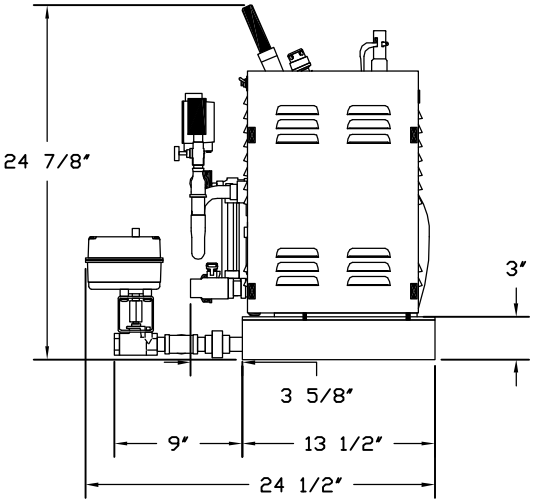


SIDE VIEW



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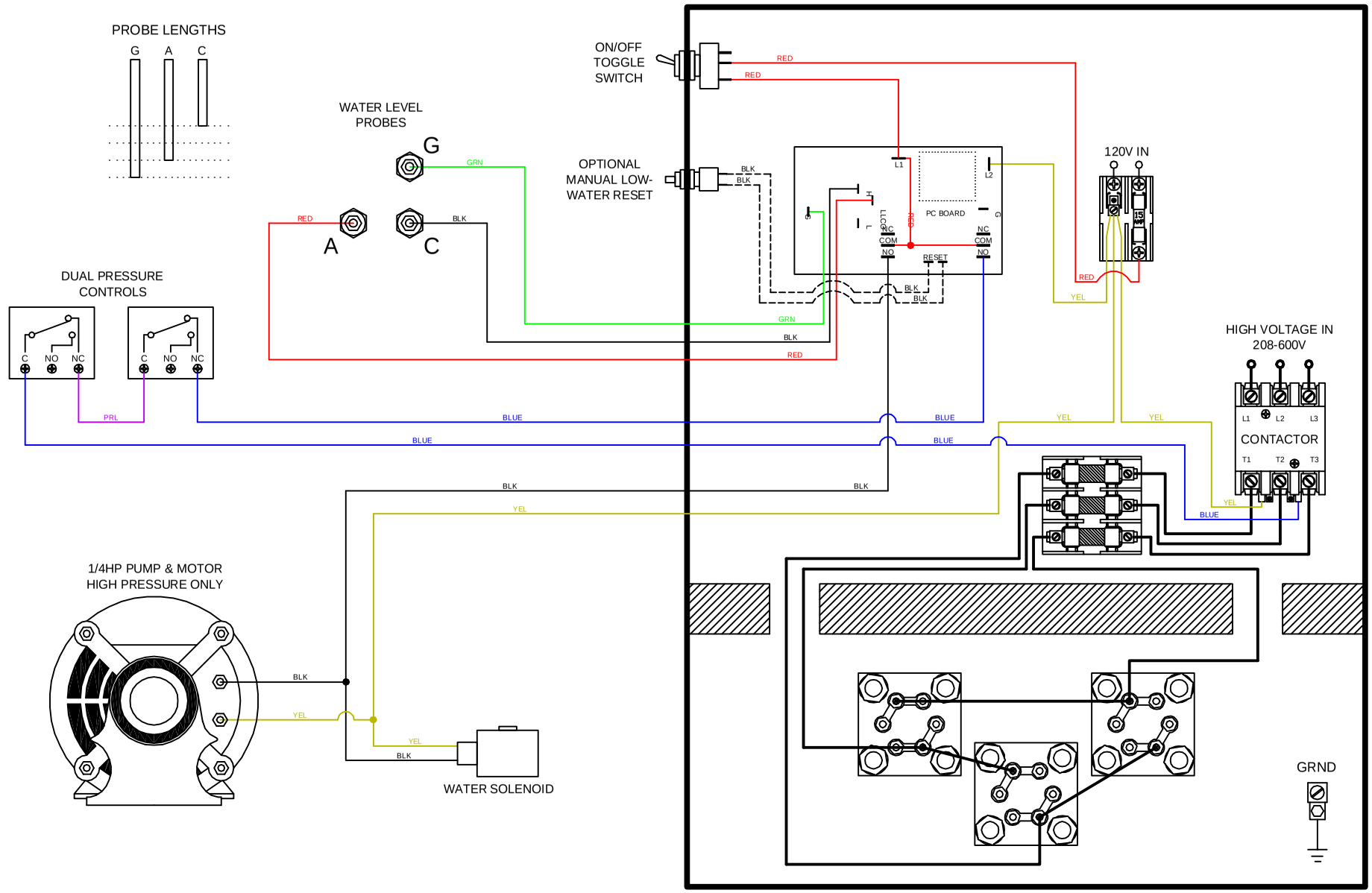
DECRIPTIONS:	DRAWN BY:	CHRISTOPHER FERRARA	07-07-09	50 Indel Ave. P.O. Rancocas, NJ 08073-0438	
HIGH PRESSURE	CHECKED:	CHRISTOPHER FERRARA	07-07-09		
MOTORIZED AUTO-FLUSH & DRAIN	ENGINEER:	-	-	DWG NO.: 431-010-030-000210	SCALE: N/A
-	APPROVED:	SAL NEGRO	07-07-09		SHEET: 1 OF 1



22 of 27

DRAWING TITLE: V-BLOCK		MODEL UNIT: VB 10-30		ELECTRO-STEAM GENERATOR CORP.	
DECRIPTIONS:	DRAWN BY:	CHRISTOPHER FERRARA	09-13-07	50 Indel Ave. P.O. Rancocas, NJ 08073-0438	
HIGH PRESSURE	CHECKED:	SAL NEGRO	09-13-07		
-	ENGINEER:	CHRISTOPHER FERRARA	09-13-07	DWG NO.: 131-010-030-111200	SCALE: N/A
-	APPROVED:	JOHN PARDINI	09-13-07		SHEET: 1 OF 1

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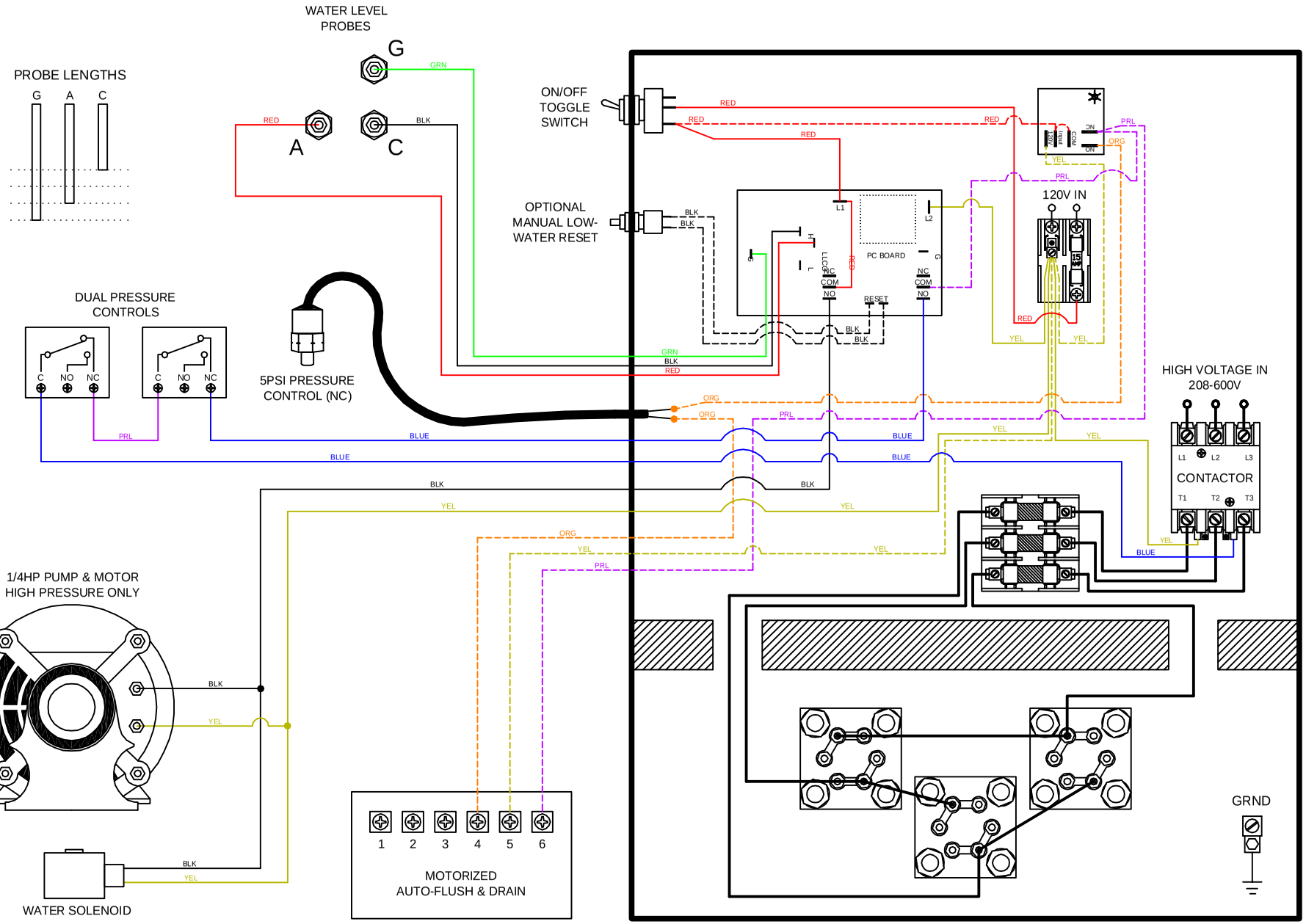

23 of 27

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DRAWING TITLE: V-BLOCK (MAFD)		MODEL UNIT: VB 10-30		ELECTRO-STEAM GENERATOR CORP.	
DECRIPTIONS:	DRAWN BY:	CHRISTOPHER FERRARA	09-13-07	50 Indel Ave. P.O. Rancocas, NJ 08073-0438	
HIGH PRESSURE	CHECKED:	SAL NEGRO	09-13-07		
MOTORIZED AUTO-FLUSH & DRAIN	ENGINEER:	CHRISTOPHER FERRARA	09-13-07	DWG NO.: 131-010-030-111210	SCALE: N/A
-	APPROVED:	JOHN PARDINI	09-13-07		SHEET: 1 OF 1

(3PH) 10-30KW (380-415V)

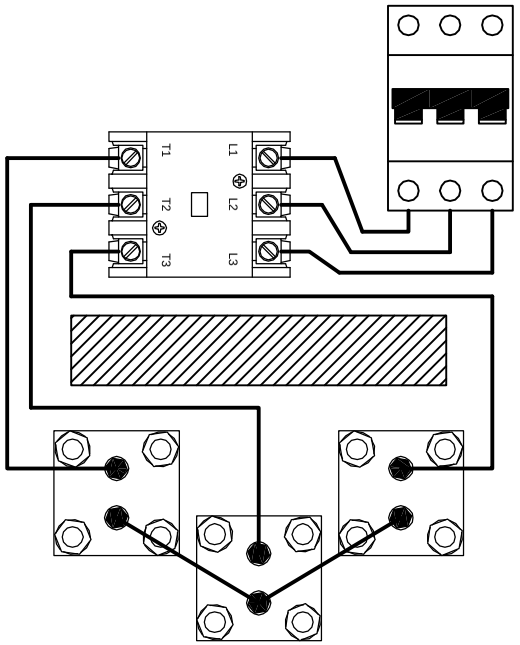
(3PH) 10KW - (380-415V)
- (1) 26131 - 3POLE 20AMP CIRCUIT BREAKER
- (1) 13067 - 50AMP CONTACTOR
- (3) 10007 - 3.33KW 208V HEATERS -or-
- (3) 10004 - 3.33KW 240V HEATERS

(3PH) 15KW - (380-415V)
- (1) 26133 - 3POLE 30AMP CIRCUIT BREAKER
- (1) 13067 - 50AMP CONTACTOR
- (3) 10008 - 5KW 208V HEATERS -or-
- (3) 10052 - 5KW 230V HEATERS

(3PH) 20KW - (380-415V)
- (1) 26135 - 3POLE 40AMP CIRCUIT BREAKER
- (1) 13069 - 75AMP CONTACTOR
- (3) 10039 - 6.5KW 208V HEATERS -or-
- (3) 10009 - 6.5KW 230V HEATERS

(3PH) 25KW - (380-415V)
- (1) 26137 - 3POLE 50AMP CIRCUIT BREAKER
- (1) 13069 - 75AMP CONTACTOR
- (3) 10104 - 8.33KW 214V HEATERS -or-
- (3) 10011 - 8.33KW 240V HEATERS

(3PH) 30KW - (380-415V)
- (1) 26138 - 3POLE 60AMP CIRCUIT BREAKER
- (1) 13069 - 75AMP CONTACTOR
- (3) 10013 - 8.33KW 208V HEATERS -or-
- (3) 10040 - 8.33KW 240V HEATERS



(3PH) 10-15KW (208-240V)
(3PH) 10-40KW (440-480V)

(3PH) 10KW - (208-240V)
- (1) 26135 - 3POLE 40AMP CIRCUIT BREAKER
- (1) 13069 - 75AMP CONTACTOR
- (3) 10007 - 3.33KW 208V HEATERS -or-
- (3) 10004 - 3.33KW 240V HEATERS

(3PH) 15KW - (208-240V)
- (1) 26137 - 3POLE 50AMP CIRCUIT BREAKER
- (1) 13069 - 75AMP CONTACTOR
- (3) 10008 - 5KW 208V HEATERS -or-
- (3) 10052 - 5KW 230V HEATERS

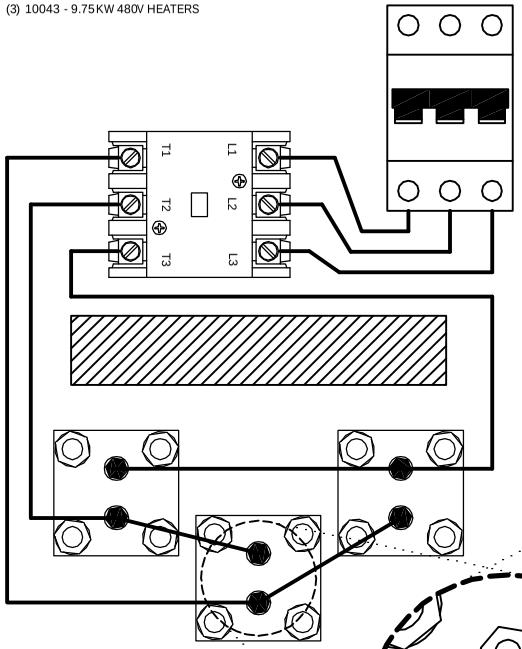
(3PH) 10KW - (440-480V)
- (1) 26129 - 3POLE 15AMP CIRCUIT BREAKER
- (1) 13067 - 50AMP CONTACTOR
- (3) 10005 - 3.33KW 480V HEATERS

(3PH) 15KW - (440-480V)
- (1) 26132 - 3POLE 25AMP CIRCUIT BREAKER
- (1) 13067 - 50AMP CONTACTOR
- (3) 10002 - 5KW 480V HEATERS

(3PH) 20KW - (440-480V)
- (1) 26133 - 3POLE 30AMP CIRCUIT BREAKER
- (1) 13067 - 50AMP CONTACTOR
- (3) 10051 - 6.5KW 480V HEATERS

(3PH) 25KW - (440-480V)
- (1) 26135 - 3POLE 40AMP CIRCUIT BREAKER
- (1) 13069 - 75AMP CONTACTOR
- (3) 10014 - 8.33KW 480V HEATERS

(3PH) 30KW - (440-480V)
- (1) 26137 - 3POLE 50AMP CIRCUIT BREAKER
- (1) 13069 - 75AMP CONTACTOR
- (3) 10043 - 9.75KW 480V HEATERS

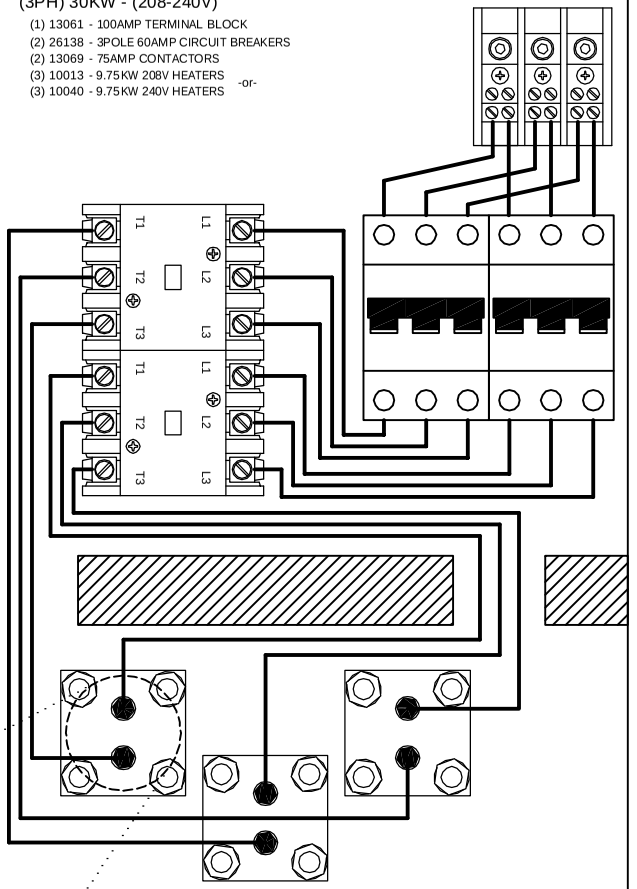


(3PH) 20-30KW (208-240V)

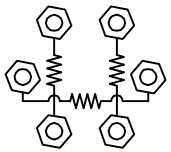
(3PH) 20KW - (208-240V)
- (1) 13061 - 100AMP TERMINAL BLOCK
- (2) 26135 - 3POLE 40AMP CIRCUIT BREAKERS
- (2) 13069 - 75AMP CONTACTORS
- (3) 10039 - 6.5KW 208V HEATERS -or-
- (3) 10009 - 6.5KW 230V HEATERS

(3PH) 25KW - (208-240V)
- (1) 13061 - 100AMP TERMINAL BLOCK
- (2) 26137 - 3POLE 50AMP CIRCUIT BREAKERS
- (2) 13069 - 75AMP CONTACTORS
- (3) 10104 - 8.33KW 214V HEATERS -or-
- (3) 10011 - 8.33KW 240V HEATERS

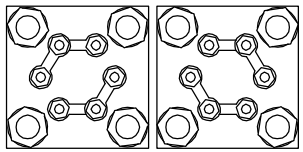
(3PH) 30KW - (208-240V)
- (1) 13061 - 100AMP TERMINAL BLOCK
- (2) 26138 - 3POLE 60AMP CIRCUIT BREAKERS
- (2) 13069 - 75AMP CONTACTORS
- (3) 10013 - 9.75KW 208V HEATERS -or-
- (3) 10040 - 9.75KW 240V HEATERS

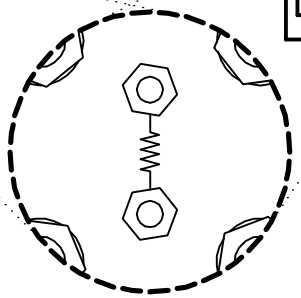


FOR 25-40KW UNITS ONLY.
HEATER COILS MUST BE
MOUNTED IN THIS POSITION.



8.33-13.33KW HEATERS CAN BE
JUMPERED IN EITHER POSITION





DRAWING TITLE: (HEATERS) VB (THREE PHASE)		MODEL UNIT: VB 10-40	
DECRIPTIONS:	DRAWN BY:	CHRISTOPHER FERRARA	12-29-09
HEATER WIRING SCHEMATIC	CHECKED:	CHRISTOPHER FERRARA	12-29-09
208-480V	ENGINEER:	-	-
THREE PHASE	APPROVED:	SAL NEGRO	12-29-09

ELECTRO-STEAM GENERATOR CORP.
50 Indel Ave. P.O. Rancocas, NJ 08073-0438

DWG NO.: 231-010-040-253000 | SCALE: N/A | SHEET: 1 OF 1

This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.

(1PH) 10KW (208-240V)
(1PH) 10-25KW (440-480V)

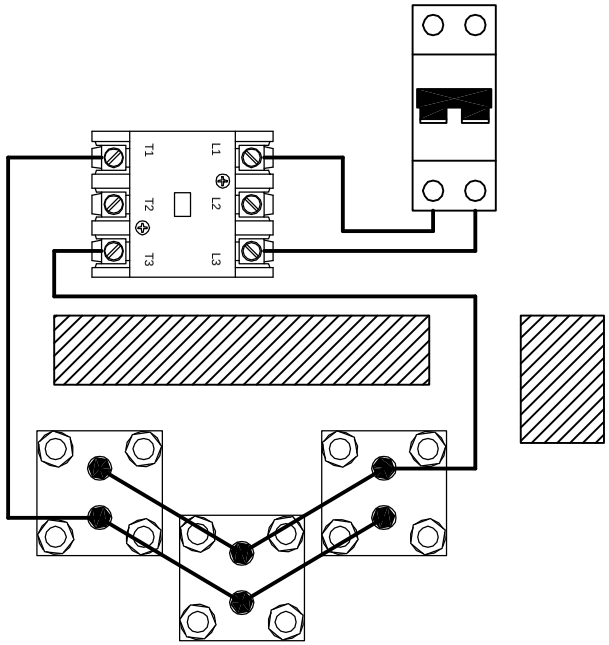
(1PH) 10KW - (208-240V)
- (1) 26119 - 2POLE 63AMP CIRCUIT BREAKER
- (1) 13069 - 75AMP CONTACTOR
- (3) 10007 - 3.33KW 208V HEATERS
- -or-
- (3) 10004 - 3.33KW 240V HEATERS

(1PH) 10KW - (440-480V)
- (1) 26112 - 2POLE 25AMP CIRCUIT BREAKER
- (1) 13067 - 50AMP CONTACTOR
- (3) 10005 - 3.33KW 480V HEATERS

(1PH) 15KW - (440-480V)
- (1) 26115 - 2POLE 40AMP CIRCUIT BREAKER
- (1) 13069 - 75AMP CONTACTOR
- (3) 10002 - 5KW 480V HEATERS

(1PH) 20KW - (440-480V)
- (1) 26117 - 2POLE 50AMP CIRCUIT BREAKER
- (1) 13069 - 75AMP CONTACTOR
- (3) 10051 - 6.5KW 480V HEATERS

(1PH) 25KW - (440-480V)
- (1) 26119 - 2POLE 63AMP CIRCUIT BREAKER
- (1) 13069 - 75AMP CONTACTOR
- (3) 10014 - 8.33KW 480V HEATERS



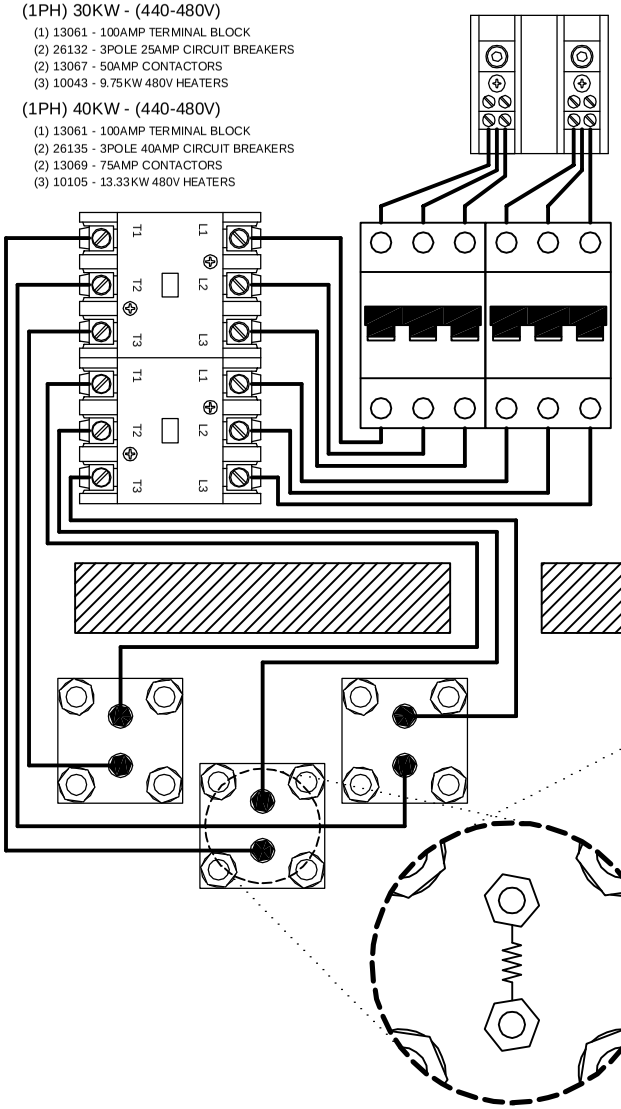
(1PH) 15-20KW (208-240V)
(1PH) 30-40KW (440-480V)

(1PH) 15KW - (208-240V)
- (1) 13061 - 100AMP TERMINAL BLOCK
- (2) 26133 - 3POLE 30AMP CIRCUIT BREAKERS
- (2) 13067 - 50AMP CONTACTORS
- (3) 10008 - 5KW 208V HEATERS
- -or-
- (3) 10052 - 5KW 230V HEATERS

(1PH) 20KW - (208-240V)
- (1) 13061 - 100AMP TERMINAL BLOCK
- (2) 26135 - 3POLE 40AMP CIRCUIT BREAKERS
- (2) 13069 - 75AMP CONTACTORS
- (3) 10039 - 6.5KW 208V HEATERS
- -or-
- (3) 10009 - 6.5KW 230V HEATERS

(1PH) 30KW - (440-480V)
- (1) 13061 - 100AMP TERMINAL BLOCK
- (2) 26132 - 3POLE 25AMP CIRCUIT BREAKERS
- (2) 13067 - 50AMP CONTACTORS
- (3) 10043 - 9.75KW 480V HEATERS

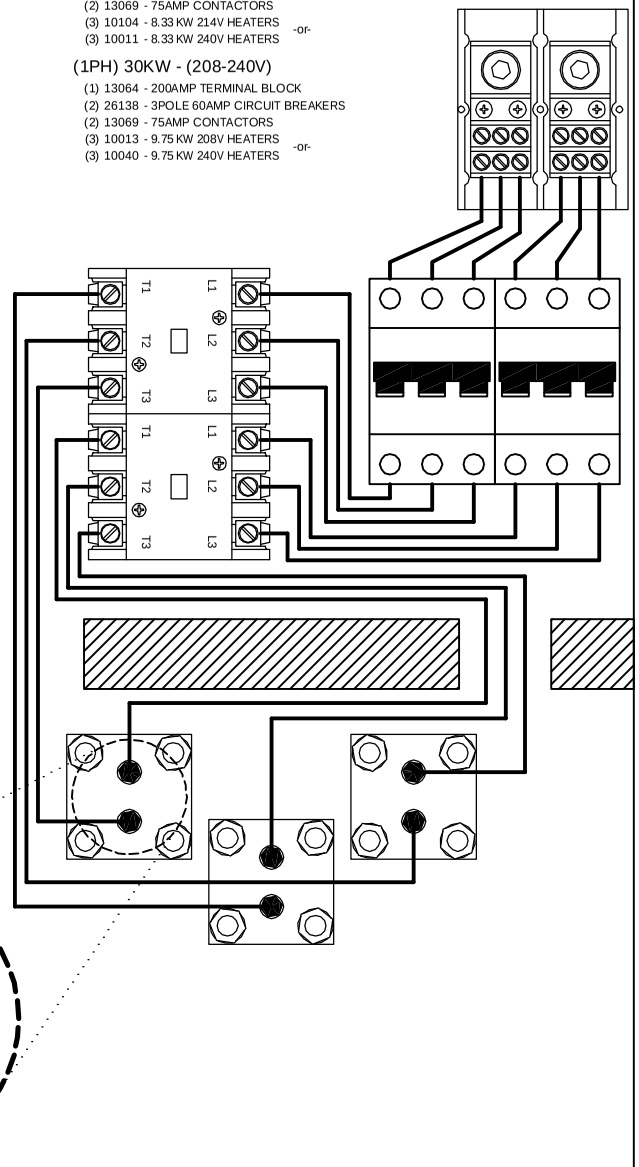
(1PH) 40KW - (440-480V)
- (1) 13061 - 100AMP TERMINAL BLOCK
- (2) 26135 - 3POLE 40AMP CIRCUIT BREAKERS
- (2) 13069 - 75AMP CONTACTORS
- (3) 10105 - 13.33KW 480V HEATERS



(1PH) 25-30KW (208-240V)

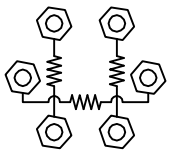
(1PH) 25KW - (208-240V)
- (1) 13064 - 200AMP TERMINAL BLOCK
- (2) 26137 - 3POLE 50AMP CIRCUIT BREAKERS
- (2) 13069 - 75AMP CONTACTORS
- (3) 10104 - 8.33 KW 214V HEATERS
- -or-
- (3) 10011 - 8.33 KW 240V HEATERS

(1PH) 30KW - (208-240V)
- (1) 13064 - 200AMP TERMINAL BLOCK
- (2) 26138 - 3POLE 60AMP CIRCUIT BREAKERS
- (2) 13069 - 75AMP CONTACTORS
- (3) 10013 - 9.75 KW 208V HEATERS
- -or-
- (3) 10040 - 9.75 KW 240V HEATERS

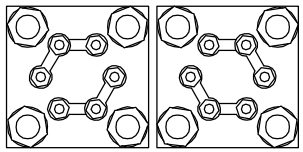


25 of 27

FOR 25-40KW UNITS ONLY.
HEATER COILS MUST BE
MOUNTED IN THIS POSITION.



8.33-13.33KW HEATERS CAN BE
JUMPERED IN EITHER POSITION



DRAWING TITLE: (HEATERS) VB (SINGLE PHASE)		MODEL UNIT: VB 10-40	
DECRIPTIONS:	DRAWN BY:	CHRISTOPHER FERRARA	12-29-09
HEATER WIRING SCHEMATIC	CHECKED:	CHRISTOPHER FERRARA	12-29-09
208-480V	ENGINEER:	-	-
SINGLE PHASE	APPROVED:	SAL NEGRO	12-29-09

ELECTRO-STEAM GENERATOR CORP.
50 Indel Ave. P.O. Rancocas, NJ 08073-0438
DWG NO.: 231-010-040-251000
SCALE: N/A
SHEET: 1 OF 1

This drawing and all information therein are the property of Electro-Steam Generator Corp. and shall not be disclosed, in whole or in part, to any third party without prior permission of Electro-Steam Generator Corp.

(3PH) 10-30KW (550-600V)

(3PH) 10KW - (550-600V)
- (1) 13067 - 50AMP CONTACTOR
- (1) 13016 - 30AMP 600V CLS-CC FUSE BLOCK
- (3) 13041B - 15AMP 600V CLS-CC FUSES
- (3) 10006 - 3.33KW 600V HEATERS

(3PH) 15KW - (550-600V)
- (1) 13067 - 50AMP CONTACTOR
- (1) 13016 - 30AMP 600V CLS-CC FUSE BLOCK
- (3) 13010B - 20AMP 600V CLS-CC FUSES
- (3) 10003 - 5KW 600V HEATERS

(3PH) 20KW - (550-600V)
- (1) 13067 - 50AMP CONTACTOR
- (1) 13016 - 30AMP 600V CLS-CC FUSE BLOCK
- (3) 13043B - 30AMP 600V CLS-CC FUSES
- (3) 10050 - 6.5KW 600V HEATERS

(3PH) 25KW - (550-600V)
- (1) 13069 - 75AMP CONTACTOR
- (1) 13017 - 60AMP 600V CLS-CC FUSE BLOCK
- (3) 13012B - 35AMP 600V CLS-CC FUSES
- (3) 10012 - 8.33KW 600V HEATERS

(3PH) 30KW - (550-600V)
- (1) 13069 - 75AMP CONTACTOR
- (1) 13017 - 60AMP 600V CLS-CC FUSE BLOCK
- (3) 13013B - 40AMP 600V CLS-CC FUSES
- (3) 10044 - 9.75KW 600V HEATERS

(1PH) 10-25KW (550-600V)

(1PH) 10KW - (550-600V)
- (1) 13067 - 50AMP CONTACTOR
- (1) 13016 - 30AMP 600V CLS-CC FUSE BLOCK
- (2) 13011B - 25AMP 600V CLS-CC FUSES
- (3) 10006 - 3.33KW 600V HEATERS

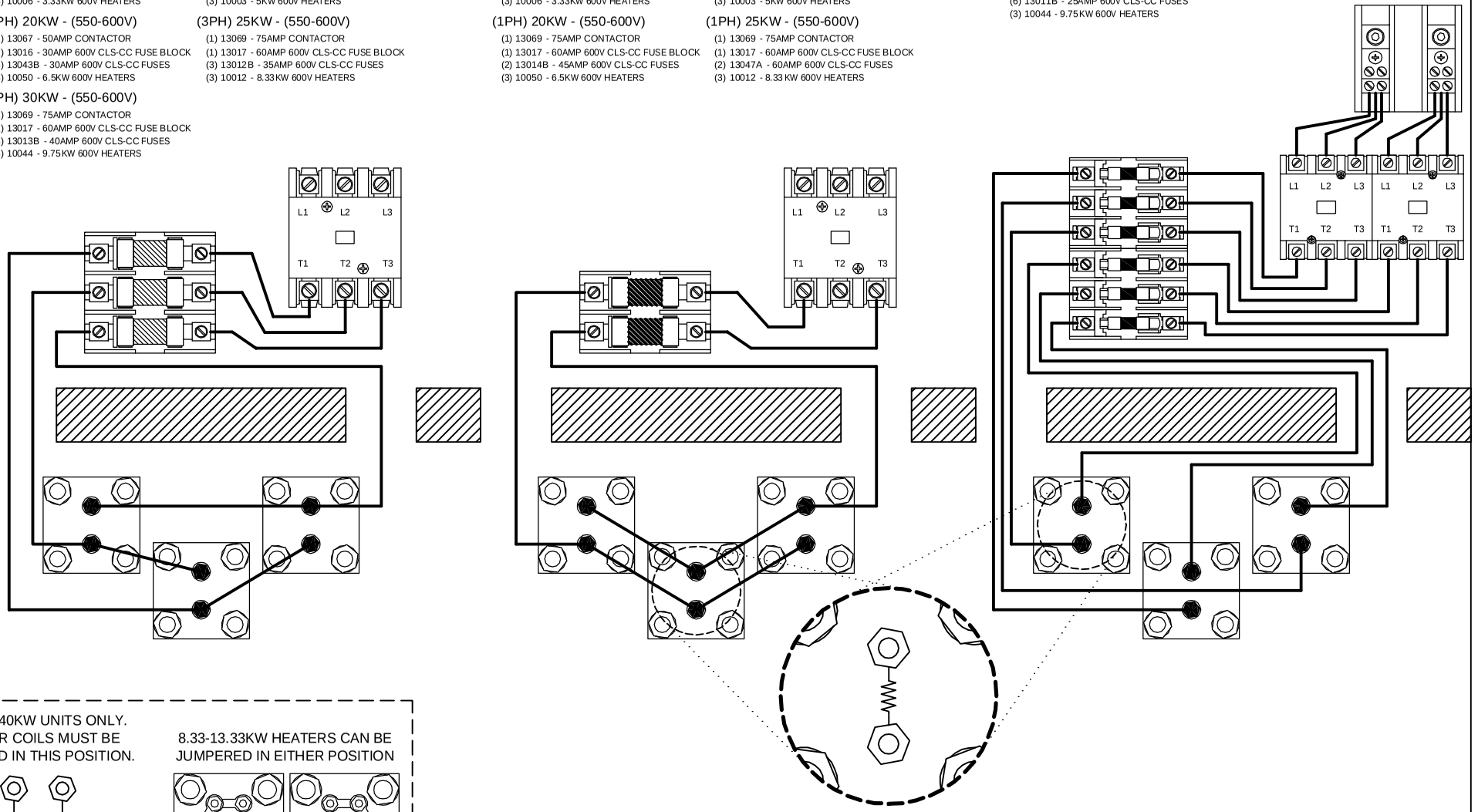
(1PH) 15KW - (550-600V)
- (1) 13069 - 75AMP CONTACTOR
- (1) 13017 - 60AMP 600V CLS-CC FUSE BLOCK
- (2) 13012B - 35AMP 600V CLS-CC FUSES
- (3) 10003 - 5KW 600V HEATERS

(1PH) 20KW - (550-600V)
- (1) 13069 - 75AMP CONTACTOR
- (1) 13017 - 60AMP 600V CLS-CC FUSE BLOCK
- (2) 13014B - 45AMP 600V CLS-CC FUSES
- (3) 10050 - 6.5KW 600V HEATERS

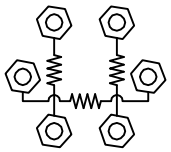
(1PH) 25KW - (550-600V)
- (1) 13069 - 75AMP CONTACTOR
- (1) 13017 - 60AMP 600V CLS-CC FUSE BLOCK
- (2) 13047A - 60AMP 600V CLS-CC FUSES
- (3) 10012 - 8.33 KW 600V HEATERS

(1PH) 30KW (550-600V)

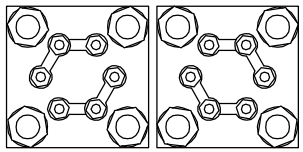
(1PH) 30KW - (550-600V)
- (1) 13061 - 100AMP TERMINAL BLOCK
- (2) 13067 - 50AMP CONTACTOR
- (2) 13016 - 30AMP 600V CLS-CC FUSE BLOCK
- (6) 13011B - 25AMP 600V CLS-CC FUSES
- (3) 10044 - 9.75KW 600V HEATERS



FOR 25-40KW UNITS ONLY.
HEATER COILS MUST BE
MOUNTED IN THIS POSITION.



8.33-13.33KW HEATERS CAN BE
JUMPERED IN EITHER POSITION



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DRAWING TITLE: (HEATERS) V-BLOCK 10-30 (600V)		MODEL UNIT: VB 10-30	
DECRIPTIONS:	DRAWN BY:	CHRISTOPHER FERRARA	12-29-09
HEATER WIRING SCHEMATIC	CHECKED:	CHRISTOPHER FERRARA	12-29-09
600VOLT - 3/1 PHASE	ENGINEER:	-	-
-	APPROVED:	SAL NEGRO	12-29-09

ELECTRO-STEAM GENERATOR CORP.
50 Indel Ave. P.O. Rancocas, NJ 08073-0438

DWG NO.: 231-010-030-660000

SCALE: N/A

SHEET: 1 OF 1

Electro-Steam Generator Corporation Terms and Conditions of Sale

These terms and conditions apply to all goods or services Seller provides. Seller recognizes no other terms and conditions unless approved in writing by Seller's authorized representative. Seller rejects any additional terms and conditions that may be contained in any document provided previously or subsequently by your company.

CHANGES: Changes made after fabrication has begun shall be submitted in writing, signed by the purchaser. Purchaser agrees to pay the cost of any changes. The specifications and prices are subject to change without notice.

CLAIMS: Title passes to the buyer upon delivery to the carrier, unless otherwise indicated. Safe delivery is the responsibility of the carrier. Damaged merchandise, if accepted, should be noted on the delivery receipt and on the freight bill before acceptance of shipment. Make claim promptly.

CONTINGENCY: All contracts are contingent upon fire, strikes, accidents, delays in transit, acts of God or other causes beyond our control.

LOCAL CODES: All steam boilers are built in accordance with ASME miniature boiler code. NOTE: It is the responsibility of the installer to conform with any state or local codes. If further inspection following modification by the installer is required under state and local codes that is the responsibility of the local installer

FREIGHT TERMS: F.O.B. FACTORY, NO FREIGHT ALLOWED. All charges for unloading and transportation to job site are at the buyer's expense.

INSTALLATION: No installation or job supervision charges are included.

ORDERS: All orders resulting from this quotation are subject to acceptance by the factory. No production will begin until receipt of purchaser's signed order and credit approval.

PAYMENT TERMS: Within Continental U.S.A., net 30 days, with approved credit from the date of invoice (not date of arrival of goods). Payment in full without retainer and/or any unauthorized sums deducted is expected.

RETURNS OF MATERIAL: No goods will be accepted for return without a return authorization number from the factory. A 25% restocking fee is charged on returns, freight prepaid.

TAXES: No taxes of any kind are included. All prices herein and/or contracts shall be subject to increase without notice by the amount of present or future sales or excise tax levied or charged, either by Federal, State or any other assessing agency.

PATENTS: Seller agrees to indemnify Purchaser against any proven claim and assessed liability for infringement of any United States patent arising from the manufacture or sale of any apparatus furnished by Seller to Purchaser.

THE FOREGOING STATES SELLER'S ENTIRE LIABILITY FOR CLAIMS OR PATENT INFRINGEMENT. Seller shall have no liability whatsoever if the claim of infringement arises out of the Sellers compliance with Purchasers specifications. Seller shall have no liability whatsoever if a claim of infringement is based upon the Purchasers use of the equipment as part of a patented combination where the other elements of the combination are not supplied by Seller, or in the practice of a patented process. Where the specifications, process, design are supplied by Purchaser, then Purchaser agrees to indemnify the Seller in like manner.of the claim or suit; and (c) purchaser provides all information and assistance to Electro-Steam Corporation, at purchaser's expense, as is reasonably necessary for the defense of the claim or suit. Electro-Steam Generator Corporation may, at its option, intervene in any suit or action brought against the purchaser on such claim.

ELECTRO-STEAM GENERATOR CORPORATION LIMITED WARRANTY:
Electro-Steam Generator Corporation fully warrants that all equipment and service supplied shall conform to the description in the quotation and agrees to repair or replace F.O.P. shipping points any parts, excepting expendable items, that fail due to defects in material or workmanship. The pressure vessel; (steam chamber) are warranted to the original Purchaser for a period of five years from the date of shipment from our factory. Mechanical and electrical components, along with accessories and hoses, are warranted for a period of one (1) year from date of shipment from our factory. IN NO EVENT SHALL ELECTRO-STEAM GENERATOR CORPORATION'S WARRANTY BE EXTENDED BEYOND THE WARRANTY LIABILITY PROVIDED BY THE SUPPLIER OR MANUFACTURER OF COMPONENT PARTS INCORPORATED IN THIS EQUIPMENT. THERE ARE NO OTHER WARRANTIES OF ANY KIND, EXPRESSED OR IMPLIED, AND SPECIFICALLY EXCLUDED BUT NO BY WAY OF LIMITATION ARE THE IMPLIED WARRANTIES OF FITNESS FOR PARTICULAR PURPOSE AND MERCHANTABILITY.

All claims for incorrect products or replacement must be made and settled prior to installation. Electro-steam Generator Corporation assumes no liability for the expense of repairs made outside its factory. Any claims for labor and/or parts will be denied unless written authorization is given by Electro-Steam Generator Corporation prior to work being done.

IT IS UNDERSTOOD AND AGREED THAT ELECTRO-STEAM GENERATOR CORPORATION'S LIABILITY, WHETHER IN CONTRACT, IN TORT, UNDER ANY WARRANTY, IN NEGLIGENCE OR OTHERWISE, SHALL NOT EXCEED THE COST OF REPAIR OR REPLACEMENT, F.O.B. SHIPPING POINTS OF DEFECTIVE PARTS. UNDER NO CIRCUMSTANCES SHALL ELECTRO-STEAM GENERATOR CORPORATION BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES. THE PRICE STATED FOR THE EQUIPMENT IS A CONSIDERATION IN LIMITING ELECTRO-STEAM GENERATOR CORPORATION'S LIABILITY. NO ACTION, REGARDLESS OF FORM, ARISING OUT OF THE TRANSACTIONS OF THIS AGREEMENT MAY BE BROUGHT BY PURCHASER MORE THAN ONE YEAR AFTER THE CAUSE OF ACTION HAS ACCRUED. THE WARRANTY FOR THIS EQUIPMENT
OR SERVICE PROPOSED IN THIS QUOTATION IS AS STATED IN THE AFOREMENTIONED PARAGRAPHS. IT IS NOT RESTATED NOR DOES IT APPEAR IN ANY OTHER FORM.

This warranty supersedes all prior verbal or written warranties.

INSURANCE: Buyer represents that they have a program of Insurance which adequately protects their interest, and that of their employees and agents, including damage to plant, property and equipment, personal injury of any kind, directly or indirectly related in any way to the equipment, service, repair or parts supplied by Seller. Accordingly, Buyer waives any claim against Seller for the foregoing, and on behalf of its Insurance Company, any right of subrogation in connection therewith.

LAW: This Agreement shall be governed by the internal laws of the State of New Jersey, USA, and any claims arising hereunder shall be prosecuted in the United States District Court having jurisdiction of causes of action arising in the District in which Seller is located.

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